LIBRARY OF CONGRESS
COPYRIGHT
DEC 23 1889
WASHINGTON

695-U2

PRICE 15 CENTS.

DECEMBER 21, 1889.

THE AMERICAN ARCHITECT AND BUILDING NEWS

VOL. XXVI. REGULAR EDITION NO. 730.

ARCHITECTVRE

ENGINEERING

DECORATION

TICKNOR & COMPANY

CONSTRVCTION

BOSTON MASS.

CONTENTS.

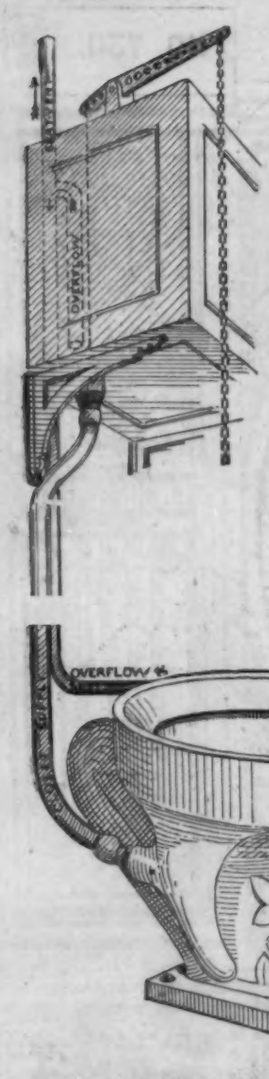
Editorial Summary.
Is Mexico's Greatest Painting a Titian?
The "Working-day" in Various Countries.
Books and Papers.
Societies.
Communications.
Notes and Clippings.
Trade Surveys.

ILLUSTRATIONS

East End of Dining-Room in the House of Hon. Whitelaw Reid, Madison Ave., New York, N. Y.
(Gelatine Print.)
Competitive Design for the Cathedral of St. John the Divine, New York, N. Y.
[Issued only with the Imperial Edition.]
Sketches by a Rotch Travelling-Scholar.
[Issued only with the Imperial Edition.]
House at Auburn, Me.
[Issued only with the Imperial Edition.]
Chateau de Josselin, Morbiban, France.
Rue de Chateau, Morbiban, France.
View to the Court-Yard of the Caso di Pilatos, Seville, Spain.

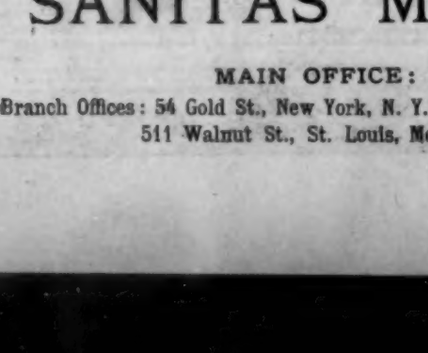
THE

SANITAS WATER CLOSET



The "SANITAS" PATENT WATER CLOSET has the simplicity of the Short Hopper, all the Sanitary advantages and conveniences of the best improved modern closets, and others peculiar to itself in being antisiphonic, quick-acting, self-sealing, free from spattering or waste of water, and, when properly set, almost noiseless in operation.

The supply-pipe between the cistern and the closet stands permanently full of water, and, discharging below the level of the standing water in the bowl, the action is instantaneous and the noise of flushing is deadened, so that when properly set and with the cover down and toilet-room door closed, no sound can be heard from without. The water is held in the supply-pipe by atmospheric pressure and will instantly restore the trap seal should it at any time be lowered by evaporation or siphonage.



SANITAS MANUFACTURING CO.,

MAIN OFFICE: 207 TREMONT STREET, BOSTON, MASS.

Branch Offices: 54 Gold St., New York, N. Y. 197 West Fourth St., Cincinnati, O. 47 to 49 Dearborn St., Chicago, Ill.
511 Walnut St., St. Louis, Mo. Sole Agent for Canada: O. Higman, 236 Sparks Street, Ottawa.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XXVI. Copyright, 1889, by TICKNOR & COMPANY, Boston, Mass. No. 730.

Entered at the Post-Office at Boston as second-class matter.

DECEMBER 21, 1889.

CONTENTS

SUMMARY: —
The Dangers attending the Borrowing of Suburban Fire-Engines. — Concealed Defects in "Blocks" of Buildings. — A Case in Point. — The Proposed Constitutional Monument in Philadelphia. — An Electric-wire Accident in Cambridge. — Another Case of Responsibility of a French Architect. — The Swiss Diligence. — Excavations at the Site of Charlemagne's Palace. 285
IS MEXICO'S GREATEST PAINTING A TITIAN? 287
ILLUSTRATIONS: —
East End of Dining-room in the House of Hon. Whitelaw Reid, Madison Ave., New York, N. Y. — Competitive Design for the Cathedral of St. John the Divine, New York, N. Y. Mr. Alexander Hay, Architect. — Rotch Travelling-Scholarship Drawings. — House of Charles L. Cushman, Esq., Auburn, Me. — Château de Josselin, Morbihan, France. — Rue du Château, Morbihan, France. — View to the Court-yard of the Casa de Pilatos, Seville, Spain. 290
THE "WORKING-DAY IN VARIOUS COUNTRIES." 290
BOOKS AND PAPERS. 291
SOCIETIES. 293
COMMUNICATIONS. —
Lessons from the Boston Fire. — Engines at the Boston Fire. 293
NOTES AND CLIPPINGS. 296
TRADE SURVEYS. 296

ONE consideration is suggested by the Boston fire of November 28, which it may not be too late to mention. In addition to the thirty or forty engines present, belonging to the Boston Fire-Department, there were about as many more in action, which came from neighboring towns and villages. Of course, it was very noble in the officials of these towns and villages to send assistance to suffering Boston, but one cannot help wondering what would have happened if a serious fire had broken out in one of these towns or villages, while its extinguishing machinery, or a part of it, was absent on its mission of mercy. Few suburban towns possess more than two or three steam fire-engines, and these have generally a large territory to protect. If one is sent away, the district to which it belongs is placed at a great disadvantage, since aid, in case of a conflagration, must be brought from a considerable distance. It is hardly necessary to say that the insurance companies keep a close watch of the fire-extinguishing appliances maintained by each town, and fix their rates of premium accordingly; and we have been told that, however the underwriters' might admire in the abstract the fraternal heroism of Boston's neighbors, they would in practice refuse to pay the insurance money for losses incurred through the absence of the regular fire-extinguishing apparatus from its proper station. As this is a very serious consideration for suburban property-owners, it is singular that some one should not have called attention to it before. Of course, the insurance companies do not care to say anything about it until the occasion arises, for the simple reason that, under this view of the case, the transfer of the engines is very much for their benefit, saving them money in one place while it relieves them of liability in another; but the owners of houses in Brookline, Newton, Cambridge, Somerville and Waltham would do well, before another great fire occurs in Boston, to ascertain definitely what are the risks they run by having the local engines temporarily absent, and place such restrictions upon the amiable enthusiasm of their fire-department officials as may seem suitable to the circumstances.

WHERE is an observation which has probably occurred to all architects familiar with city building, but which is not so obvious to the average purchaser or tenant, that houses built in blocks, all at the same time, and of the same pattern, are more likely to have concealed defects of construction and drainage than houses built singly. No doubt, a man who builds six or eight houses at once from the same plans can save something by the wholesale contracts which he is enabled to make for labor and materials, but the extent of his operations tempts him to make further savings, by using defective materials or improper methods of doing work, which would not, in a single house, be worth making at the risk of losing a purchaser or tenant, but which, when multiplied by six, or eight, or ten, amount to a considerable sum. Of course, there are well-built blocks and badly-built single houses, but we venture to say that the refuse lengths of drain-pipe, the clay-joints, the job-lots of imperfect soil-pipe, bought for a trifle at the foundry, the damaged lime, the split gas-pipes, the second-quality hardware and the botched workmanship are to be traced much more frequently to the blocks than to the single houses. Another guide to the inexperienced purchaser is to be found in the artistic appearance of the house which he looks at. It is often said that a commonplace-looking house is the safest to buy, because, if the purchaser has to sell it again, no one can object to its appearance, while any departure from the ordinary type, although it might please some persons, would offend others. We have our doubts as to the æsthetic wisdom of this maxim, but as a practical guide it is still more objectionable. In these days, a well-studied front implies that an architect has been concerned with the building which it adorns, and, in spite of all the disparaging remarks made about architects, very many of which, by the way, are set afloat, with interested motives, by the speculating builders, the fact cannot be questioned that houses constructed under the supervision of real architects are, independent of their artistic interest, generally far better built, better planned, better drained, better plumbed, better heated, better ventilated and better lighted than those erected and sold by builders. They often, but by no means always, cost more per square foot of ground covered than builders' houses, but they usually cost less for the same accommodation, since any architect worthy of the name can plan more and better rooms in the same space than an unskilled builder's clerk; and, contrary to the common idea, they generally contain, for the same money, more and better materials and workmanship than the builders' houses. The reason of this is that architects are ordinarily employed by responsible owners, who pay their bills in cash as the architect certifies them, and mechanics and dealers in materials are glad to offer their most favorable terms to a customer who can be relied upon not to fail suddenly, with assets amounting to one per cent of his liabilities. Moreover, the speculating builder, who piles up mortgages on his houses, is obliged to pay enormous rates of interest, which he must save somehow out of the cost of building, and his men, even if they are capable of good work, are more likely to take pattern by him, and give the smallest value for the most money, than to try, as all decent workmen do under the supervision of an architect, to attract attention by their skill. The architect's five per cent is, it is true, to be added to the cost of the buildings which he designs, but this would usually be covered by the difference between the interest which a responsible owner and a speculating builder would have to pay on the investment, leaving the improved planning and construction, and the extra discounts for cash on all the contracts for work and materials, as additions to the value of the building which cost the owner or purchaser nothing.

ANOTHER ingenious builder has been caught in New York, by the inspectors of the Board of Health, who are remarkably successful in detecting frauds upon the sanitary regulations of the city. The builder in question constructed a row of houses, and, under his contract, was obliged to connect their drains with the sewer. The cellars were excavated in rock, and to run the drain-pipes out to the street would have involved blasting out more rock, at an expense of three hundred dollars for each house. It is needless to say that a prudent speculating builder will do a good deal of thinking before he will spend three hundred dollars on anything that will not show when it is done, and it soon occurred to our hero that he could run the drains back, through the cellar, and into the yard, where there would be no rock to excavate, and where the ends of the pipes could discharge into a lot of loose stone, which formed the foundation of the fence-wall between his property and that of his neighbors. So long as no drainage went through the pipes, this sort of outfall would be just as good as any; and after the houses were sold, and the money paid, the new proprietor might have the arrangement changed, if he did not like it. The houses were sold, in this condition, and in course of time mysterious illnesses began to occur in them. The Board of Health inspectors were called in, and soon found the cause of the trouble, but we are not informed whether the builder was brought to justice. Of course he ought to be, for the protection of the public in future, but, in practice, it is difficult to obtain convictions, even in worse cases than this.

We have seen a house in New York, on a prominent corner on upper Broadway, where the soil-pipe ended just under the first story floor. The occupants of the building did not use the cellar, and the workmen who came to remodel it inspected the foundation walls and piers from a raft of planks.

THE scheme for the erection of a monument in Philadelphia, at the expense of the General Government, to commemorate the first century of the existence of the United States, which has been in the hands of the Governors of various States, has advanced another stage. Last July, the Governors of the thirteen original States met in Philadelphia, but decided to invite the coöperation of those of all the present States, and to adjourn until winter. A few days ago the adjourned meeting took place in Washington, and a bill was adopted, for presentation to Congress, providing that one citizen from each State and Territory, to be nominated by the respective Governors, and thirteen citizens of Philadelphia, shall constitute a commission, with full power to erect a suitable monument, with the sum that Congress may appropriate.

ONE of the most striking electric-wire accidents yet described occurred in Cambridge, Mass., a few days ago. A stray telephone wire, which had been long disused, dropped from its support at one end, and fell across the street. Mr. Eveleth, the Superintendent of the College buildings, with some of his men, attempted to cut the wire away, but it came in contact with the overhead wire of the electric railway which runs through the street, and, hanging thence to the ground, exhibited a series of electrical phenomena. According to the newspaper accounts, which generally need to be taken with a grain of scientific salt, the current which escaped from the hanging wire as it swayed back and forth, "tore up the street, and melted the railroad tracks at different points." Meanwhile, Mr. Eveleth continued his efforts to catch the wire with ropes, and remove it, but before he succeeded in doing so, it came in contact with other telephone wires, causing the burning-out of several telephones in the neighborhood, and, in one of its swings, touched a horse which was being driven past, killing him instantly, and stunning his driver. Fortunately, no further damage occurred, either to the public or the courageous volunteers who were at work on the wire, and it was finally detached, and put where it could do no more mischief.

A VERY interesting case, which contains several points of great importance, is submitted to M. Collet-Corbinière by a correspondent of *La Semaine des Constructeurs*. An architect was commissioned to build a school-house, with town-hall connected, as is often the case in France, on a piece of ground bordered by a brook. The mayor informed the architect that the brook, even during a flood, never overflowed the site of the building, and the architect arranged for a cellar under a part of the structure, with a window in it. After operations were begun, the mayor began to be afraid that there might be an overflow, and directed that the cellar should not be excavated; so the floors were laid without one, the timbers being from two to four and one-half feet above the natural surface. Before the foundation walls were done, the architect, on one of his visits of inspection, was shown by the mason, in presence of the contractor, that the window, in the place where it was planned, would be covered by the outside steps, and he gave a verbal order to the contractor to make openings in the walls on the other side of the building, to give air under the floors, instead of building the window. The contractor either forgot all about the matter, or, with a malice which is altogether too common among contractors, purposely disobeyed the order, in the hope of getting the architect into trouble; and the ventilators were not built; and the architect did not subsequently notice the omission. Four years afterward the floors were found to be settling, and the architect, on examining them with the contractor, found that the beams were badly rotted, those which were farthest away from the ground and from the brook having, curiously enough, suffered more than those nearer the surface, and, presumably, over moister ground. The architect, finding that the trouble had evidently proceeded from lack of ventilation, through the omission of his ventilators, offered to pay half the cost of a new floor, proposing that the contractor should pay the other half; but the contractor absolutely refused to pay any part, and produced a plan, made by the architect's clerk, in which the foundations were shown without any opening. Thereupon the town commenced suit against the architect and contractor jointly to compel them to replace the floor, and the question was referred for advice to *La Semaine*.

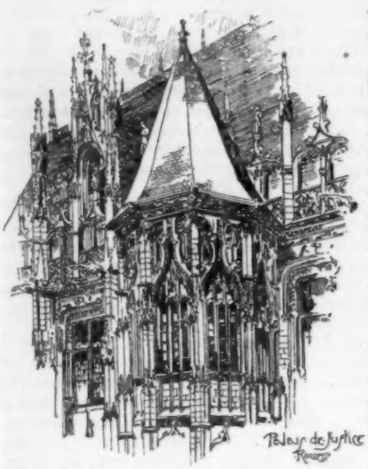
M. COLLET-CORBINIÈRE gives the architect, we are happy to say, a great deal of comfort. In his opinion, to speak briefly, the architect is not liable for any part whatever of the damage, and he quotes from M. Frémy-Ligneville's manual the rules of law which lead him to this conclusion. In the first place, it is well established in France that an error of construction, in order to involve the architect in liability, must be proved to have proceeded from following his plans and specifications, or from obeying his orders. In cases where he has given no orders, or where the plans and specifications are silent, the whole responsibility for proper construction rests upon the builder, who is expected, just as much as the architect, to know the rules of the art which he practises. It is true that in the present case the builder professes to have a foundation-plan with no openings shown, but the architect is not irrevocably bound by a plan delivered to a contractor. He is perfectly free to modify it, as the work goes on, in such a manner as the circumstances may seem to demand, and the plan thus modified becomes the direction which the contractor is required to follow. Nor is it necessary in France that such orders for modifications should be in writing, even though they may rescind or change portions of the plans and specifications. The contractor is at liberty to defend himself from responsibility by pleading the verbal orders of the architect, and, in the same way, the architect is entitled to prove that he gave verbal orders correcting mistakes in his plans or specifications, and, if he can do so, his plans and specifications so corrected stand as those for which he is responsible, and the builder disregards or disobeys them at his own sole peril.

SOME of our tourists will be glad to learn that the Swiss people, like their summer visitors, are not all pleased with the abolition of the diligence, and the substitution of the railway train. Not long ago, a new railroad was opened between Langenthal, on the Bâle-Berne road, and Huttwyl, which had previously been accommodated by a stage from Langenthal. The surrounding country is pleasant, but not remarkable for fine scenery, such as could be better enjoyed from a diligence than a railway car, yet the people along the road were so sorry to lose the old stage that on its last trip, the day that the trains began running, the driver and his horses were arrayed in deep mourning, and were received with funeral music. Unless this particular route was more free from dust than most of the diligence roads in the Swiss lowlands, the grief of the natives at the discontinuance of stage travel would not meet with unmixed sympathy from foreigners, but every pleasure traveller must be sorry to think that the Brunig diligence route, perhaps the most varied in Switzerland, has been abandoned, and when the Simplon post-road gives way to a ten-mile tunnel, it will be time for the lovers of the picturesque to unite in the defence of Nature against engineering.

A LITTLE exploration has recently been made at Lower Ingelheim, on the Rhine, now a village of two or three thousand inhabitants, but eleven hundred years ago, the site of Charlemagne's favorite palace, where gathered the most intellectual company in Europe, and where, later, his miserable descendants came to die. The ruins of the palace itself fell down about fifty years ago, but careful investigation has now shown that the walls of the basilica originally attached to the palace are still standing, and form a part of the exterior walls of a cluster of houses, which are still inhabited. Although a royal basilica of the eighth century is an object of the highest architectural and archæological interest, the occupants of the houses around it refuse to allow themselves to be disturbed, and the generous amateur who supplied funds for the work has been obliged to content himself with obtaining an agreement from the lord of the manor that no further alteration shall be made in the walls, and with laying out neatly the only accessible approach to the ruins, to which he has also caused a tablet to be affixed. The court-yard of the palace, the scene of so many romantic adventures, appears to be now occupied by a Jewish cemetery, which cannot be interfered with, but the Hebrew congregation has very courteously agreed, without compensation, to keep the ground in good order, and to give the State the first right to purchase it, if a sale should ever be made.

IS MEXICO'S GREATEST PAINTING A TITIAN?

THE TITIAN ENTOMBMENT AT TCZINTCZUNTCZAN.



THE August [1887] number of *Harper's Magazine* was given exceptional artistic importance by presenting the first published account of the existence, in a remote and obscure corner of this continent, of a superb art-treasure; nothing less than a great painting believed to be one of the masterpieces of Titian. The account was given in Mr. Charles Dudley Warner's interesting series of "Mexican Notes."

The eminent artist Mr. Frederick E. Church is the one who made the discovery of this work in what is now an obscure Indian village in the heart of the interior of Mexico. Mr. Church and his wife had recently spent several winters in Mexico, and the writer of these lines, who was there in 1883 and 1884, recalls the enthusiasm with which Mr. Church told him of encountering this wonderful picture. Though Mr. and Mrs. Church were both invalids, their love of the grand scenery of the country led them to undertake journeys and endure hardships from which many a robust person would shrink. On their way to Morelia, the capital of the beautiful State of Michoacan, they had obtained in Lake Cuitzeo, along the shores of which the Mexican National Railway runs for some distance, a taste of the charms of the picturesque lake-region of Mexico. Hearing while in Morelia — a city to which they became deeply attached; and justly, as may be imagined from Mr. Warner's fascinating description in the July *Harper's* — of the beauties of Lake Pátzcuaro, they resolved to go thither, notwithstanding the fact that the city of Pátzcuaro, near the lake, could, at that time, only be be reached by a rough diligence journey of something like forty miles, although it has recently been made accessible by a branch of the National Railway. They found Pátzcuaro delightful with its pure, invigorating air and noble scenery, and while there they took a trip down the lake, in a native dugout, to the Indian village of Tczintczuntczan, a distance of something like fifteen miles. The trip may now be made with less difficulty, for, within a few months, an iron steamboat has been placed on the lake by an American company. Here, in the ancient church, they found this wonderful old master, the value of which Mr. Church at once perceived, having a valuable gallery of fine old paintings, including two Murillos — one of which is the celebrated Santa Rosa of Peru — at his home, Olane, on the Hudson. With Mr. and Mrs. Church at the time was the talented young New York artist, Mr. Howard R. Butler, who made a hasty pencil-sketch of a portion of the picture. Mr. Church said that the effect of so unexpectedly finding this great treasure in the heart of the wilderness, as it were, here in the Western world, was indescribably pathetic. Mr. Church also spoke of the great olive-trees in the great yard of the church — described in Mr. Warner's article — as finer than any he had seen anywhere, even in the Holy Land. Mr. Warner doubts if the world can show elsewhere a more interesting group of these historic trees.

The name of the village, Tczintczuntczan, is said to signify "humming-bird" in the Tarascon vernacular, and its pronunciation resembles the sound of that bird. When Mr. Church first came across the painting, it is doubtful if any other American, at least any one who could appreciate its great value, had ever seen it, and its existence was known to very few outside the immediate vicinity. It is one of the few great paintings that escaped the spoilers when the churches and convents of the country were devastated in the war of the Reform, and is probably the most valuable of all the paintings by old masters that came to Mexico when it was the pet province of Spain. Even Madame Calderon de la Barca, who visited Pátzcuaro, and who was enthusiastic in her praise of the lake, does not mention this painting, although her cultivated mind took quick note of such things.

Mr. Church mentioned an interesting relic of Paganism which he observed in the same church that contains the painting, in the shape of two mountain lions vigorously hewn from stone, crouching on either side of the altar. They were idols in the days before the Spanish conquest, and it seemed strange to find them preserved in a Christian church together with the finest religious painting in the country.

Mr. Warner went to Mexico with Mr. and Mrs. Church in the winter of 1886, and visited Tczintczuntczan with them in March. He was profoundly impressed by the picture, as well as delighted with its environment, as may be seen from the following:

"In the enclosure are two ancient churches, one with a tower and bells, the parish church, gaunt and plain, the other, the chapel attached to the monastery. Both have an appearance of decay and non-use, the religious accommodations being now in excess of the dwindled population. The monastery, with its outer stairway, gallery and courts, is a decidedly picturesque old pile, with color subdued, but not much faded. The adjoining chapel is large, and not above the average of Mexican church interiors in interest, and the cloisters are beautiful. In the centre, walled by a low parapet, and open to the sky, is such a garden as one finds in the decaying monasteries of Italy, with orange-trees, and a tangle of vines and a cat asleep in the sun. The cloister is of two stories, with round arches, one above the other; the ceiling corners are of wood carved in arabesque, as in Moorish architecture. On the walls are very rude and highly-colored paintings, representing the rites of baptism, confirmation, confession, and so forth. It is altogether a bit of the Old World, and one has here indefinable sense of peace and repose.

"The aged priest who has charge of the premises and lives in apartments above the cloisters, the only intelligent man in the village, was unfortunately absent, and we had difficulty in persuading the girl who answered our call from the upper gallery to come down and unlock the sacristy door. In the sacristy is the treasure of Mexico. The room is oblong, and has windows only on one side, toward the west, broad windows closed with wooden shutters. On the walls are several, so-called, sacred daubs and a number of uncouth and rubbishy images. But across, and filling one end over the vestment chest, hangs 'The Entombment,' by Titian. The canvas, which is enclosed in a splendid old carved wooden frame, is fifteen and one-half feet long. It contains eleven figures, all full-size. In the upper left-hand corner is a bit of very Titianesque landscape, exactly like those which Titian was fond of introducing into his pictures, and which his contemporaries attributed to the influence of his birthplace, Pieve di Cadore; on a hill are three crosses in relief against an orange sky. In the lower left-hand corner is Mary Magdalen seated on the ground, contemplating the nails and crown of thorns. In the lower foreground, very realistically painted, are an ointment box and a basin.

"The figure of Christ, supported in a sheet, is being carried to the tomb — a dark cavern in the rear. Two men, holding the sheet, support the head, and one the feet. Aiding also in this tender office is a woman, her head bowed over that of the dead Christ. Behind is St. John, Mary the Virgin, Mary whom Christ loved, and St. Joseph. There are two other figures, partially in shadow at the right, spectators of the solemn scene, and one of them is said to be a portrait of Philip II.

"The flesh-painting of the central figure is marvellously fine in imitation of the rigid pallor of death, while that of two of the figures carrying the body is equally true to robust life. The 'St. John' is exquisitely beautiful in drawing and color, conveying the traditional grace and manly tenderness of the beloved disciple. The vestments are in Titian's best manner, the reds and deep blues harmonious and beautiful in tone.

"The grouping is masterly, natural, free, and as little academic as such a set scene well can be. Indeed, composition and color both proclaim the picture a great masterpiece. As you study it you have no doubt that it is an original, and not a copy. It has the unmistable stamp of genuineness. The picture, thanks to the atmosphere of this region, is in a perfect state of preservation, the canvas absolutely uninjured.

"Is this great picture really a Titian? It seems incredible that a work of this value and importance should be comparatively unknown, and that it should be found in a remote Indian village in Mexico. But the evidence that it is a Titian is strong. It was sent to this church by Philip II, who seems to have thought that no gift was too costly or precious for the cause of the true faith, and who, no doubt, was deceived by the exaggerated Spanish narratives of the native civilization and taste. Titian, we know, visited at the court of Philip, and executed works to his order. It is possible that this picture is a replica of one somewhere in Europe. I think that any one familiar with the works of Titian would say that this is in his manner, that in color and composition it is like his best pictures. I trust that this description of it will lead to some investigation abroad that will settle the question.

"We stayed in the village several hours, and returned again to look at the picture before we left. The western sun was shining into the broad windows, illuminating the shabby apartment in which it hung. And in this light the figures were more lifelike, the color more exquisite, the composition lovelier, than before. We could not but be profoundly impressed. I cannot say how much was due to the contrast of the surroundings, to the surprise at finding such a work of art where it is absolutely lost to the world and unappreciated. I say unappreciated, for I do not suppose there is a human being who ever sees it, except at rare intervals a foreign visitor, who has the least conception of its beauty. And yet these ignorant natives and the priest who guards it are very much attached to it, attributing to its presence here, I think, a supernatural influence. They will not consent to part with it, perhaps would not dare to let it go. A distinguished American artist was willing to pay a very large sum of money for it; the Bishop of Mexico made an effort to get possession of it and carry it to the capital; but all offers and entreaties have been refused and resisted. How long it will be safe in a decaying building, in the midst of a population that have no conception of its value as a work of art, is a matter of conjecture."

The pencil-sketch which furnished the illustration for Mr. Warner's article was probably made by Mr. Church. Slight though it is, it is

sufficient to indicate the masterly quality of the painting as a composition, though, of course, it can give no idea of its superb color. It is to be hoped that Mr. Warner's article will lead to the complete identification of the work.

Meanwhile, let us examine the accessible sources that may give us some information on the subject. Recent investigations seem to establish that Titian never went to Madrid, as stated by Mr. Warner, although he was highly honored by Philip II, as well as by the other leading sovereigns of Europe. Palomini maintains that Titian was in Madrid from 1548 to 1553, but, according to Nagler, this is incorrect, since in 1548 he was employed in Germany by the Emperor Charles V. Gaye, however, produces a letter from Philip II to Titian written in 1561, and a patent from the same monarch to the artist in 1571. These dates appear to indicate the period in which Titian was painting for the Spanish court. He may, however, have been much earlier in Madrid, since he painted Philip II as a boy and also as a young man, whose friendly countenance gives no sign of the gloomy nature of the tyrant he afterwards became.

Titian's connection with Philip II began at Augsburg, on his second visit to that city, in 1550, whither he was summoned by the Emperor Charles V, Philip's father, to make a likeness of the prince, then twenty-four years old. Titian found great favor with Philip, and the connection was kept up until the artist's death. Many of his masterpieces were painted expressly for Philip, and forwarded from Venice to Madrid, but it appears that Titian never visited the Spanish capital.

The first "Entombment" which we find mentioned in connection with Philip II must have been a notable work, but, unfortunately, it was lost, as appears from a letter written by Philip to Count de Luna from Brussels, January 20, 1559, making a complaint that a large canvass of that subject, despatched by Titian from Venice in November, 1557, and received shortly after at Trent by the postmaster, De Tassis, had never reached its destination. He desired a search to be made for the missing work, and gave directions for the discovery and punishment of the thieves.

On July 13, 1559, Philip wrote from Ghent asking for a second version of the "Entombment" to replace the missing painting. On August 3 of that year Secretary Garcia Hernandez wrote from Venice to Philip concerning Titian's work in hand for the monarch, saying: "He will give me the 'Christ in the Tomb,' of larger size than that which he sent before, the figures being entire."

In September, Titian wrote to Philip: "I send your Majesty the 'Actæon,' 'Calisto' and 'Christ in the Sepulchre' in place of that which was lost on the way, and I rejoice that, though larger, the last of these pictures has succeeded better than the first, and is more worthy of acceptance from your Majesty. I attribute this improvement in a great measure to the grief which I felt at the loss of the first example, which proved a strong stimulus to exertion in this and my other works, in order doubly to recoup the damage."

In the "*Life of Titian*," by J. A. Crowe and G. B. Cavalcaselle, published in 1877 and drawn chiefly from new and unpublished sources, the foregoing information concerning Titian's connection with Philip is found. Of the subject under consideration the same work says:

"In the 'Entombment' which accompanied the 'Calisto' and 'Actæon' to Madrid, Titian repeated a subject which he had studied frequently since the first example of it had been sent to Mantua some thirty years before. Comparing the picture, as executed for Federico Gonzaga, with that produced for Philip II, we may be struck as with something familiar lingering undefinedly, though still indelibly, on the mind. It is not that the theme is exactly the same in both pieces, since different moments in the action of entombment are represented, but that in both we observe generally the dead body of Christ, the agony of Mary, the grief of the Evangelist and the wail of the Magdalen. The same figures do not affect similar action in both compositions, but certain rythmic movements recur, as that of the man stooping over the form of Christ and presenting the back of his head and frame to the spectator, and that of the Virgin looking with anguish at her Son. Besides these, we have modifications of types which are to be found as studies of expression in single canvases. The Magdalen is still the model which graced the 'Venus Worship' at Madrid, or the 'Entombment' of the Louvre; the Virgin is nearly related to the grieving 'Madonna' which we saw displayed at the death-bed of Charles V. But here the Saviour is not carried to the tomb. He is lowered into it, and the sepulchre presents to us its marble sides adorned with bas-reliefs of antique carved-work. The legs of Christ are nearer to us than His head, but the foreshortening is so cleverly managed that the parts which might have seemed too near to be in focus are concealed in the grasp of the bending Nicodemus, while the head grandly reposes on the breast of Joseph, who kneels at the opposite end of the grave with a strong grip of the body under the arm-pits. The flexibility of the frame, the raised legs and hanging hand are very grandly represented. The Virgin, taking the left arm of her Son, which she hopes to kiss, still hovers over him with an agonized look expressed with great force. With equal power we note the grief of the Evangelist behind Mary, who wrings his fingers, and the wail of the Magdalen, whose yellow robe flies and leaves her white dress exposed as she comes sobbing and hair-dishevelled to catch a last glimpse of the Redeemer. There is no such gorgeous coloring, no such magic effect of light, no such careful definition of outline or gloss and grain of surface in this as in the Mantuan example, but it is the work of a man much more expert and practised than of old—of a man who knew the laws of composition and applied them, a man acquainted with inexhaustible varieties of expression, a realist who knows every action of body or limb by heart. Less rich in tints, less engaging in form, less select in features, the *dramatis personæ* at Madrid are superior to those at the Louvre, inasmuch as they are more true to nature and have a deeper meaning. Less highly colored, they bear closer inspection, and the nude especially is modelled with appropriate shades of tone with a decision and firmness which left almost nothing for subsequent glazing or blending. It is, in fact, as if we should distinguish the grave doctrine and depth of Bach from the playful and melodious power of Mozart, or compare the profound but realistic Rembrandt with the brilliant and cavalier-like Van Dyke."

"The 'Entombment' at Madrid was frequently repeated," says the same authority, "not only by Spanish and other craftsmen, of which examples may be found in Spain and in England, but by Titian himself or his pupils. One of the replicas to which Titian personally may have contributed is that which came into the Mantuan gallery, and is traced to the collection of Charles I and James II of England. Another may be that which passed into the hands of the Prime Minister of Spain five years before Titian's death. At a conference held between Antonio Perez and the Venetian envoy, Donato, in 1572, the former expressed a strong wish to become possessed of one or two pictures by Titian, and Donato hastened to communicate this wish to his government. The consequence was that the Council of Ten sent a competent judge to Titian's house, who chose two canvases, one sacred and the other profane, and these were forwarded by the next opportunity to Spain. Shortly after this Antonio Perez fell into disgrace, and suffered imprisonment for alleged treason. His family, in want of funds, announced an auction of his pictures, and of these the Imperial envoy, Khevenhiller, made a report to Rudolf II, describing, amongst others, the 'Entombment' by Titian, as a replica of the King's at the Escorial. It is not known what became of the picture after this report, but some persons think that it may have remained in Spain, from whence it was taken by the Duke of Buckingham in 1622. There is no doubt that an 'Entombment' by Titian formed part of the Duke's collection, and this was sold at Antwerp after his death to the agents of the Archduke Leopold William. Comparing this piece, which is now at Vienna, with the earlier one at Madrid, we may concede that it is the same composition, yet with varieties. For here the Magdalen is represented wringing her hands, whilst little more than the head of St. John the Evangelist is seen between the profile of the Virgin and the shoulders of the saint next him. Unhappily, the canvas appears to have been mutilated and patched up anew, and this treatment may have caused injuries which prevent us from distinguishing much of the personal labor of Titian. The master himself never thought out any better design of the subject than that which he used at Madrid; the sketch—pen-and-ink-and-bistre heightened with white—is still preserved in the collection of Oxford University, and showed that Titian seldom made preparatory paintings in oil, but simply finished large pictures from drawings."

We learn that the picture sent to Philip II, in 1559, is that which now appears numbered 464, measuring 1.37 metres in height by 1.75, in the Madrid Museum. Unlike the "Diana and Actæon" and the "Calisto" it was not given away to Charles Stuart or to the Duke of Grammont, and it remained for centuries the ornament of the altar in the Iglesia Vieja at the Escorial, after having been in Philip's lifetime on the altar of the Royal chapel at Aranjuez. On a sheet fastened to the right side of the sepulchre is the inscription, "*Titianvs vecellivs æqves cæs.*" "Half the composition is relieved (to the left) on a dark wall, the other half on a landscape. The saint at Christ's head is in brown, the other at the feet is in red, with a striped sash. The white winding-sheet falling over the bas-relief of the tomb gives some subtle varieties of light."

Another "Entombment" in the Madrid Museum, is numbered 491, and is on a canvas 1.30 metres by 1.68. It varies in so far that the saint on the extreme right wears a robe embroidered with black flowers, the tomb is without bas-reliefs, and the word *Titianvs f.* is written on the stone of the left side. "But the execution is not that of Titian or his pupils, but that of a Spaniard who may be Del Mazo." P. de Madrazo's catalogue shows that a copy of this "Entombment," by Del Mazo, once rested on an altar in the chapel of the Alcazar at Madrid. A second copy of the "Entombment" is still in the Iglesia Vieja at the Escorial.

The "Entombment" at Hamilton Palace is a free adaptation, with figures of life-size in a gloomy landscape. "At Christ's head are two bearded men. The Magdalen wrings her hands. The figure in the right foreground holding the feet is only seen to the thigh. The style is that of a follower of the Bassani, a Spaniard rather than an Italian, who loses the lines of Titian's composition, and tries in vain to reproduce his rich colors. His general tone is hard and red."

That of Ambrosiana, Milan, "again is a variety, with the Mary and a standing saint in prayer to the left; on the base of the tomb, '*Titianvs.*' But the handling is that of an imitator of the seventeenth century."

In the Torrigiani Collection, Florence, is another adaptation, with life-size figures of the Madrid "Entombment," with different dress. "The figures are all half-lengths, and lighted by a torch held by one of the men to the left. One of them, to the right, is much injured. On the whole a poor work of the seventeenth century."

The "Entombment," from the Duke of Buckingham's Collection, is in the Belvidere, at Vienna, No. 32, second room, first floor, Italian schools. "It has a strip of new canvas round three sides, and is signed on the right of the tomb 'Titianvs.' The scene is an enclosed space and in gloom. When in the collection of the Duke of Buckingham, this piece was three feet high by four feet, six. It was engraved by Paul Pontius, at Antwerp, and then showed the full-length of the figures."

The earliest "Entombment," by Titian, of which we have record, is that known as the Mantuan. This work is ascribed to a period subsequent to the correspondence between the master and his patron, the Marquis Federico Gonzaga of Mantua, in 1523, for whom it was executed. It is called one of the finest performances from Titian's hand, since he finally lost the impress of Palmesque art. In the seventeenth century it passed from Mantua into the collection of Charles I of England, and since the days of Louis XIV has been an ornament of the Louvre. Of this work, Crowe and Cavalcaselle say:

"The 'Entombment,' though incomparably below Raphael's version of the same theme in respect of balanced distribution and complexity of line, is still for Titian a representative piece. It would be true to say that none of the figures perform all that they seem to promise, and that there is more of symbolism than of absolute reality in the action of every one of them; and yet the impression produced by the picture, as a whole, is probably much greater than that which we receive on looking on the Borghese altar-piece; and this arises, no doubt, from a surprising variety in type and expression, a subtile display of light surfaces upon a ground studded with diverse shades of gloom, and a richness of coloring which throws over the whole canvas a mysterious wierdness. Two men bending over the corpse of the Redeemer are supposed to bear the awful weight of His frame; St. John Evangelist behind merely holds up the arm; but these three figures alone form the pyramid of the composition, and the group of the Virgin and Magdalen on the left is but a splendid bit of *fioritura*. The body of Christ is suspended in a cloth, one corner of which is held at the hip by Nicodemus, the other tightly grasped at the knee by Joseph of Arimathea. Nicodemus, in a blood-red tunic of complex texture, with a green lining and brown sleeves, shows his back to the spectator as he strides and bends to his load, whilst Joseph, in a deep green coat and his shirt-sleeve rolled up, kneels with one leg on a stone and sways the body in the direction of the tomb. The Evangelist in rear, between both follows their movement and looks up as he raises the Saviour's wrist. To the left the Virgin, in a blue mantle, wrings her hands and partly rests on the supporting arm of the Magdalen, whose yellow dress and loosened hair flutter in the breeze. Taken singly, each of these figures is moving in a quick momentary way. The form of Christ is perfectly symmetrical, of great strength and preternatural size, the head majestically enframed in flowing locks and copious beard, the limbs and feet beautifully moulded and admirably drawn, the whole shape, if not ideal and 'god-like,' still a wonderfully supple and choice representation of select nature. The bearers finely display the raw muscle of strength in movement that looks spontaneous and true, whilst the action is cleverly promoted by earnest and telling expression; and yet in all this exhibition of contrasted inertness, motion and strain, there is much that is merely show. The effort of Nicodemus and Joseph is unreal, for the cere-cloth which they hold bears no trace of tension, and experience tells us that two men in these positions would hardly lift the manly load between them. But in spite of these incongruities and imperfections, which, indeed, defy detection unless we free ourselves from the charm that enwraps us, the scene looks real; and the faults are neutralized by modulations of darkness and gleams of light cropping up here and there with a startling vividness peculiar to Titian, or by tones of a penetrant force and richness which stir fibres that would remain inevitably motionless before pictures of the Tuscan School. Both light and shade and color are made subservient to the concentration of focal effect. Whilst the form of Nicodemus throws the head and frame of the Redeemer into darkness, the whole of the legs and parts about the hips shine brightly in the ray which strikes simultaneously on the dazzling white of the cere-cloth and illumines the bearded profile of Joseph, the fine-cut features of John, and the faces of the Marys, casting a lurid glare that fitfully flits from a break in the wind-beaten heavens. The same gleam sets the clouds in the distant sky into red edges, and sheds a depth as of night on the tree-tufted knoll to the right, in a recess of which the sepulchre is yawning.

"The 'Entombment' closes a period which opens with the 'Christ' of 'The Tribute-Money.' It still reminds us of Giorgione in the picturesque form and outblown hair of the Evangelist. It still recalls Palma Vecchio in a certain moulding of face and limbs, in shallow depressions of stuff in drapery and in contrasts that bring before us varieties of weather-beaten flesh in males and pearly skin in women. As regards color, effect and elevation of proportion, it is far ahead of anything that either Palma or Giorgione ever produced, whilst as regards expression and the rendering of passion no painter of the Venetian School can now compare with Titian. Not to speak of the calm repose of the Savior, or the busy intentness of Joseph, there is a wildness of anguish in the Magdalen, a depth of agonized grief in the Virgin and a tumult of feeling in the Evangelist which stir the soul, and for technical handling who shall say that Titian was ever surpassed, when he notes how subtly the livid faces are blanched by grief, and lighted with the sun's glare or pitted in tone against the glow of ruddy hair. Everywhere a grand facility and surprising versatility in touch. Here a surface worked out with liquid tint modelled into thin softness of film, there a great body of pigment with spare saturation and occasional charge of solid color, an intertress of delicate and studied blending, heightened by golden reflexes. But whilst the master still reminds us of his earlier companions in the field which he now occupies without a rival, he reveals to us also the sources from which his disciples in the Venetian School were inspired. Of Palma and Giorgione there sits a reminiscence which tells of that which has passed and gone, whilst certain forms like that of the bending Nicodemus or Joseph foreshadow the coming of Paul Veronese and Giacomo Bassano; and it is well thus early to note the spring at which these great provincials drew, because it is the fashion to urge that Titian took from them at a later period what, it is clear — they merely took from him.

"The 'Entombment,' 'a Mantua piece in the first privy lodging at Whitehall,' was sold to Jabach after the death of Charles I for £120. It had been a favorite, we cannot doubt of Van Dyck, whose style was greatly influenced by it. A clever Venetian — perhaps a disciple in Titian's own workshop, made an exact copy of it, which, till lately, was preserved in the Manfrini Collection."

This work is registered in an inventory of the Mantuan Palace in 1627. It is now No. 465 at the Louvre, and is noted in Vilot's catalogue as 1.48 metres by 2.05. The Manfrini picture is of same size as the work in the Louvre.

This Manfrini "Entombment," is pronounced an original by Nagler, who, as may be seen from the following, terms the canvas in the Louvre a replica:

"Here," says Nagler, "Titian rises to the height of poetry, and has painted a soul-picture worthy to stand in beauty beside the works of Rafael and Francia. Particularly in the head of Mary is the acme of tragic pathos attained. The face of the Saviour in its color is the only unsatisfactory feature; in pose the figure is highly successful. Joseph of Arimathea, who has a splendid head with a beautiful black beard, holds the body by the feet. His face has an indescribable and most attractive expression of awe mingled with pity. Between the two figures is another assistant of an ordinary type, in whose face pity and sympathy have taken the place of vexation. On the extreme left is Mary. The face of the bowed mother is set with an expression of that deepest pain when the eyes are tearless; the pale hands are pressed together in agony. John, who stands with an incomparable expression of dividing his deep sorrow and care between the two beloved ones, holds Mary as she is sinking forwards. Here Titian has shown himself one of the greatest of spiritual painters — something that seldom occurs with him, since his sensuous surroundings have usually led him to care more for a splendid and beautiful superficial representation. The picture in the Louvre is a replica of this."

At least, one Titian is known to have been on this continent, for Mr. Bullock, of London, the founder of the Egyptian Museum, is stated by Nagler to have found in the United States, in the early part of this century, a great painting which appears to have come out of the collection of Charles V. It represents the siege of Tunis, and was painted in 1532 under the supervision of the Emperor. It came to London in 1841. It is sixteen feet long.

The importance of the subject has justified the foregoing details. There can be no doubt that the great painting at Tezintczuntczan is related to the notable group of "Entombments" by Titian, described in the foregoing. It is, of course, too early to establish whether it is an original from the master himself, the work of one of his pupils, or a copy or variation by some other painter. The indications point, however, very strongly towards the correctness of Mr. Warner's theory. If it is not an original by Titian, it must be either a copy or a variation of one of his works. No trace, however, is found of an original of this picture, either in European collections or in the records of Titian's work. Its size and its striking excellence as a composition — sufficiently manifest even in the reproduced pencil-sketch accompanying Mr. Warner's article — make it seem improbable that it is a variation. History tells us of two "Entombments" by Titian, of whose whereabouts nothing now appears to be known, and the conjecture naturally arises whether this work in Mexico may not be one of these. It might not be unlikely that the first one painted for Philip II and lost on the way should have finally turned up and have been sent to Mexico by the monarch. But it will be seen that this could not have been that one, for the picture painted to replace it is stated to have been larger than the lost one, and yet the Madrid work measures only 1.75 metres in length. That of Tezintczuntczan, however, with a length of 15½ feet, according to Mr. Warner, is more than twice as long as that of any of the other Titian "Entombments" known, and it contains a greater number of figures.

The other "Entombment" of which trace has been lost is that stated to have been in the collection of Philip's Prime Minister, Antonio Perez, supposed to have been the sacred subject mentioned as having been purchased of the master in Venice. To be sure, the Perez picture has been described as a replica of the King's at the Escorial, but possibly this may have been an inaccuracy, referring to its having the same subject, though, had it been the work now in Mexico, it seems probable that its greater size would have been mentioned. At all events, it seems to be pretty well established that the latter came to the church at Tezintczuntczan as a present from Philip II, and the Perez work is the only Titian known to have been

in Spain at that time which might have been the same. Of course, however, it is possible that the Mexican work might have been obtained by Philip II without the record of the transaction having been preserved.

The sketch in *Harper's* shows a close kinship of the work in Mexico to the "Entombment" in the Louvre. The composition more nearly resembles the former than that of Madrid. Here, also, the dead Saviour is carried into the tomb supported in a sheet, instead of being lowered into the sepulchre, as in the latter work. In both composition and action, however, it is indisputably superior to the Louvre "Entombment," and must, therefore, be of a later date. The faults emphasized in the criticism of the Louvre picture quoted above are not evident here. It is the work of a riper period. It seems as if the artist, aware of the deficiencies in the Mantuan picture, had in this work gratified a desire to give the motive a more adequate illustration. The Louvre "Entombment" is the reverse of this in position, and the close resemblance between the two compositions may be seen by beholding an engraving or photograph of the former reflected in a mirror and comparing it with the sketch in *Harper's*. The resemblance in the figures of the Virgin and of St. John, and of the stooping man at the head of the corpse with his back partly towards us, is particularly striking. The superiority of the Mexican work in action is manifest in the two figures supporting the head of the Saviour, particularly in the uneven step of the nearer one — exactly that of a man bearing a difficult burden. The body of the Saviour, also, has the calm repose of death, while in that of the Louvre it seems more like that of a sick or wounded man.

Should it be established fully that the largest and best of Titian's "Entombments" exists in this remote Mexican village, it would be sufficient to make the place, with its beautiful location by the lake, its romantic and picturesque situation and its perfect climate, one of the greatest art-shrines in the Western World. Much as it would adorn an art-museum in a great city, its effect in such a place would be incomparably greater, more certain to touch a responsive chord in the breast of the appreciative beholder, and it alone would make it worth while to undertake a journey to Mexico. If it is possible to secure its freedom from harm in its present location, it is to be hoped that it will continue to remain there.

Sylvester Baxter.

THE ILLUSTRATIONS

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

EAST END OF DINING-ROOM IN THE HOUSE OF HON. WHITELAW REID, MADISON AVE., NEW YORK, N. Y.

[Gelatine Plate.]

COMPETITIVE DESIGN FOR THE CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK, N. Y. MR. ALEXANDER HAY, ARCHITECT, LOWELL, MASS.

[Issued only with the Imperial Edition.]

SKETCHES BY A ROTCH TRAVELLING-SCHOLAR. MR. E. A. JOSSELYN.

[Issued only with the Imperial Edition.]

HOUSE OF CHARLES L. CUSHMAN, ESQ., AUBURN, ME. MR. G. M. COOMBS, ARCHITECT, LEWISTON, ME.

[Issued only with the Imperial Edition.]

CHATEAU DE JOSSELIN, MORBIHAN, FRANCE.

In our issue for February 27, 1886, we published a view of the façade which fronts on the court of honor very different in style from the fortress-like portion that overhangs the Oust, the oldest portion of this building. The round towers are founded on the natural rock and the walls of the building follow the trend of the rocky river bank. The building which belongs to the Prince de Léon was in a great measure restored in 1867. The general picturesque character of the little town in which the château stands is shown in the companion drawing.

RUE DU CHATEAU, MORBIHAN, FRANCE.

VIEW TO THE COURT-YARD OF THE CASA DE PILATOS, SEVILLE, SPAIN.

Mark of a Revolutionary Riot. — Very few, if any, of the thousands who daily pass the park at Bowling Green are aware that the railing around the park bears silent but the liveliest kind of testimony to a revolutionary episode. All the posts are broken at the top. They once bore round knobs with the medallions of George III, which were broken off by the angry patriots. — *New York Press.*

THE "WORKING-DAY" IN VARIOUS COUNTRIES.[1]

An exceedingly interesting report has recently been issued by a committee of the British House of Commons on the "hours of work in foreign countries." The information has been obtained from Her Majesty's representatives in the various countries dealt with, with the object of comparing the condition of the British workman with workmen in other lands.

The report shows that legislation on the subject in the United States is far from being uniform. In New York, an Act passed in 1870, prescribes eight hours as the legal day's work for all classes of mechanics, workingmen and laborers, excepting those engaged in farm and domestic labor, but overwork for extra compensation by agreement is permitted. So far, it may be presumed, that the Act simply operates to enhance the rate of wages.

Another section of the statute makes this Act apply to all mechanics, workingmen and laborers employed by the State or any municipal corporation therein, through its agents or officers, or in the employ of persons contracting with the State or such corporation for performance of public works. A violation of the Act constitutes a misdemeanor.

An Act passed in 1886 makes twelve hours' labor in twenty-four, with reasonable time for meals, a working-day in respect to the street surface, and elevated railroads chartered by the State in cities of over half a million inhabitants. An Act passed in 1887, referring to cities of one hundred thousand inhabitants and over, makes ten hours the limit, within a range of twelve hours.

In New York and other cities in the State, nearly all classes of mechanics and all connected with the building-trades work nine hours per day, excepting on Saturday, when eight hours is the rule.

In Connecticut the only act on this subject is one making eight hours of labor performed in any one day "by any one person" a lawful day's work, "unless otherwise agreed." As a fact, with very few exceptions, the hours of labor of mechanics and other laboring people, are ten per day, or sixty hours per week.

In Maryland a powerful movement for shortening the hours of work was set on foot in 1886, resulting in a partial success for trades demanding nine hours a day, and a failure for those demanding eight. On the whole, ten hours a day make the actual working-day in Maryland for men and nine for women. In many cases throughout the States it is to be observed that while the law prescribes a certain limit to the hours of labor, it permits more extended hours to be adopted "by agreement."

In France the hours of adult labor are regulated by a series of decrees, of which the earliest sanctioned by Parliament promulgated in September, 1848, enacts that the workingman's day in manufactories and mills shall not exceed twelve hours of "effective" or actual labor. A decree issued in May, 1851, exempts certain workers. Among these we find stokers and firemen, together with persons employed in such occupations as the manufacture of glue, soap-boiling, milling, printing and lithographing, casting, refining, tinning and galvanizing metals, and making projectiles of war. Two additional hours are described as "granted" in sugar mills and refineries, and in chemical-works. Other exceptions are allowed for limited portions of the year. In 1885 a circular was issued by the Government stating that the limit of twelve hours per diem was not to be imposed where hand-power was employed, but was to be confined to factories and mills in which the motive-power was steam. No workshops were to come under the clauses of the Act that did not employ more than twenty hands in any one shed.

In 1889, another decree exempted from the law of 1848, laborers employed on any works executed by order of the Government in the interest of the national safety or defence. The report sent to Lord Salisbury on this subject, says: "It is likewise to be borne in mind that there is in France no compulsory observance of Sunday, and no day of habitual rest."

The narrow scope of the law prescribing a maximum of twelve hours "effective labor" is shown by the fact that while recent Parliamentary reports state there are in France between six and seven million persons earning daily wages, the reports of the Inspectors of Factories only record a population of three hundred and fifty-nine thousand adults subject to the Act of 1848, of whom forty-

[1] From the London *Standard* (rearranged).

one per cent are women. Accordingly the report of the British Foreign Office says, it would appear that, beyond this comparatively small number, the great majority of working-people, masons, laborers, smiths, carpenters and others, are free to work for any number of hours that may suit their inclinations.

A careful perusal of the reports of French Inspectors of Labor appears to show that the Act of 1848 is very loosely interpreted. It is even doubtful whether the section limiting the actual working-day to twelve hours was intended to include or exclude hours of rest. Practically, the legal time is made to exclude rest. This makes the working-day so much longer. "Effective" time often extends to thirteen and fourteen hours in many weaving establishments. As a rule, Frenchmen are present in the shops at least fourteen hours out of every twenty-four.

In the reports which treat of Belgium we meet with a singular piece of independent testimony to the forwardness of England in factory legislation. This occurs in a document drawn up by M. Van Cleemputte, member for Ghent and reporter of the Committee of the Chamber of Representatives on the bill introduced by the Belgian Government for regulating the work of women and children in industrial establishments. After sketching the legislation of foreign countries on the subject, the report points out that Continental Europe has been preceded in this matter "by the country which, of all others, regards with the greatest suspicion the interference of the executive: it is the Classical land of *laisser faire*, aristocratic England, which has set us the example." The committee responsible for this report enlarged the bill so as to include regulations for women and children.

Concerning the actual hours of adult labor in Belgium, some difficulty is said to be experienced in getting at the facts. The evidence given before a Belgian Royal Commission showed that railway-guards are sometimes on duty for fifteen and even nineteen and a half hours at a stretch, and the Brussels tramway-drivers are at work from fifteen to seventeen hours daily, with a rest of only an hour and a half at noon. Brickmakers work during the summer months sixteen hours a day. In sugar-refineries, the average hours are from twelve to thirteen for men, and from nine to ten for women. The cabinet-makers both at Ghent and Brussels assert that they often have to work seventeen hours a day.

Apart from more laborious occupation, Mr. Gosselin, of the British Legation at Brussels, is inclined to give eleven hours as the average day's labor in the majority of trades in Belgium, writing at the close of June (1889). Mr. Gosselin states that as yet there is no law in Belgium regulating or limiting the hours of adult labor. But underground labor is forbidden for boys under twelve and for girls under fourteen years of age.

In European countries, the strict terms of the law are often subject to "modification" by a Minister of State.

In Austria, the law provides that the duration of work for factory hands shall not exceed eleven hours out of twenty-four, "exclusive" of periods of rest. These are not to be less in the aggregate than an hour and a half. The rule can be modified by the Minister of Commerce in conjunction with the Minister of the Interior, allowing longer hours for a limited period.

In Switzerland, the law provides that a normal working-day shall not exceed eleven hours, reduced on Saturdays and public holidays to ten. Power is reserved for prolonging the working-day in certain circumstances.

Among the countries having no laws affecting the hours of adult labor, Germany is conspicuous, together with Russia. Of Greece it is declared that the "social conditions of this country have not arrived at that point of progress where the interference of the State between the employer and the operative becomes necessary."

BOOKS AND PAPERS

UNTIL within a few years Spain was a terra incognita to most travellers, whether they were influenced by the ordinary purposes of the sight-seer, or carried with them the more serious intentions of the architectural student. The great peripatic race, the Anglo-Saxon, both English and American branches, found that the discomforts they would have to endure when exaggerated by the seclusiveness and hostility of the conservative Spaniards made the life of a bird-of-passage anything but an agreeable one, and, though now and then some one did succeed in making a fairly comprehensive trip, the impression that most people had of Spain and its buildings was such as could be derived from the arid surroundings and barren architecture of Madrid, the wonders of the Alhambra at Granada, and the interesting things that could be seen at Seville, Cordova, Toledo and some of the cities of the coast, all of which places have been for a long time accessible to the ordinary traveller. But the marvels of Spanish Gothic and later works, with their strange blending of Romanesque virility and Moorish femininity, that are to be found at Salamanca, Valladolid, Zamora, Burgos, Segovia, Oviedo and other less well-known places in Northwestern Spain were rarely visited by any one, and still less frequently by members of that advance-guard of modern architectural progress, the wandering photographers. The many improvements that have been made in the portability of photographic paraphernalia, the invention of the dry-plate and the film negative, have changed all this, and in the last half-dozen years professional and amateur photographers have wandered through the length and breadth of the land, and have returned laden with spoils, for which they find a ready market, for architects, having once learned something about the quantity and quality of the material that has for so long lain hid from them in the inaccessible wilds of Northern Spain, welcome with eager avidity all that these useful purveyors bring them. At the same time, the ameliorating influences of modern civilization have spread themselves through Spain *pari passu* with the introduction of railways, and the traveller who will stay at home if he cannot be surrounded in his journeyings with something akin to the comfort he meets with in other parts of Europe now no longer hesitates to risk his temper and his health in a trip through Castile and Leon.

Those who recall the history of the country, its occupation by the Romans, the incursions of the Carthaginians, the inroads of the Gallic tribes and the Vandals, succeeded by the occupation of the entire country by the Visigoths, the introduction by these of the Arabs into the country, which ended in the subjugation of the southern part of the peninsula to the upholders of the tenets of Moslemism, would be led to expect, and not in vain, to find traces of Roman, Gallo-Roman, Phœnician and Arab remains in better or worse states of preservation, and in greater or less quantity. Then, too, when is remembered the vast wealth which in the fifteenth and sixteenth centuries was poured into the country from the Spanish possessions in America, it is only reasonable to look for buildings built in the prevailing styles of those times, on which no inconsiderable portion of this income had been lavished, and here again expectation will be more than realized. But Spain was so devoted a daughter of the Church, and was so insistent in promoting all her plans for the propagation of the true faith with all the support that men and money could afford, that the permanent evidences of the possession of great wealth are not so numerous as would have been the case had France or Italy had the disbursing of the same funds. It was the wars of Charles V and Philip II, particularly of the latter, which were carried on for the purpose of stamping out Protestantism in the Low Countries, that bankrupted the country, and naturally, while money was being used for the procurement and sustenance of the mighty armaments that were kept in the field for years because of the unconquerable obstinacy of the amphibious Dutchmen, it could not be used for building purposes. Nevertheless, Philip found means to keep hands on enough to build the famous Escorial Palace some thirty miles from Madrid, which he had vowed to build to the honor of St. Lawrence — on whose day the battle of St. Quentin was fought — provided that he won the day. This famous but most cold and cheerless building was designed by Juan Baptista de Toledo, though it was carried out during the score of years it was building by Juan de Herrara, whose name is most usually associated with it. A greater contrast could not well be conceived than that made by this building, sometimes called the "eighth wonder of the world," the special glory of the second and purest period of Spanish Renaissance, and some of the famous works of Moorish architecture in Southern Spain. A general view of the Escorial, taken from a different point-of-view from any we have before seen, is contained in the portfolio before us — a portfolio which affords the promise of one of the most attractive contributions to the literature of architecture that has ever been compiled with the aid of that most useful of coadjutors, the enterprising photographer, who works with his head as well as with his hands.

It may be recalled that some eight or ten years ago we published some colored prints of the aqueduct of Segovia and the Puerta de Dore Cantos at Toledo and then stated that they were reproductions after some colored prints which owed their existence to some Russian or Polish nobleman, who had travelled through Spain with an extremely capable artist in his train, and had, on his return, published the results of his studies in Spanish architecture, in a manner and with a sumptuousness that only a thoroughly educated man, and a nobleman at that, could accomplish.

The present work, we imagine, owes its being indirectly to similar travels and investigations undertaken by Adolf Friedrich, Count von Schack, to whom it is so warmly dedicated, with a reference to the very unusual value of the investigations made by him at a time when it was no easy matter to travel in Spain. This new work is to be published in six parts, in portfolio, containing each twenty-five gelatine prints, 14″ x 20″, with a certain amount of descriptive text, at the very moderate price of ten dollars per part. The fact that the text is in that most laborious of civilized languages, the German, will not materially detract from the value of the plates to those who do not read that language, for each plate bears in Spanish, German and French the name of the building or view shown, the particular epoch or style to which it is to be ascribed, the actual date of the building and as often as possible the architect's name — pretty much everything, that is, that an architect cares to know.

The first portfolio contains a miscellaneous assortment of plates ranging between Plates 2 and 134, and so gives an admirable idea of the scope and character of the entire work, and contains as representing the Arabic style, the plan of the Mosque at Cordova and two interior views, which admirably show the bewildering forest of

[1] "*Die Baukunst Spaniens*" in ihren hervorragendsten Werken, dargestellt von Max Junghändel, Architect. Dresden: J. Bleyl. Sole Agents for the United States, Brentano Bros., Chicago.

columns and arches which make this one of the most impressive interiors the world contains. The Moorish style is represented by a view of the Alhambra and four interior views, familiar enough, but here beautifully presented. The Mudejar style, that graceful hybrid which represents the blending of Moorish now with the Spanish Gothic and now with the Spanish Renaissance, is shown by but a single plate which has so appealed to our appreciation that we have had it translated into ink, so that it might find a place with the illustrations of this issue. The Romanesque work is rather meagrely represented by a very huddled-up view of the east end of the old Cathedral at Salamanca, and the Church of St. Stephen, at Segovia. Two views of Burgos Cathedral, which one never wearies in looking at, give an idea of what Spanish Gothic in its latest stages was, while of the three other plates of Gothic work the interior of San Juan de los Reyes, at Toledo, shows traces of work that might fairly be called Churrigueresque, so blatant is its flamboyancy and exuberance. Churrigueresque work — the last stage of the Spanish Renaissance — is not otherwise represented in this fragment of the publication, but there are half a dozen plates devoted to the first stage of the Spanish Renaissance, the Plateresque, which is, after the Moorish work, perhaps the most typical architectural production of the country, and the one, moreover, which is likely to be of most interest to architects of to-day, in that it offers suggestions which can be adapted to the needs of modern building in any country. It is a strange jumble of styles and forms, but, in spite of its arrant and unreasonable eclecticism, it is almost always graceful and interesting.

There is, perhaps, not more than one of these plates which lack a very real interest, and if we say that we never saw together twenty-five plates which had a greater or more varied attractiveness it would not be saying too much. The execution of the work is worthy of the conception, and Herr Junghändel who selected the subjects, the photographer who made the negatives and the printers who produced the plates have good reason to be satisfied with their labor; and if faithful work is ever properly repaid they will probably not repent of their undertaking. The work is one to hoard one's money for and buy, even if one cannot really afford to do so.

Of making many books there is no end, and it is to be presumed that there never will come a time when some writer cannot be found who has a last conclusive word to say upon the very gnarled and venerable subject of the strength of beams and columns. The mediæval architects and builders were reasonably free from any such literary tendencies, contenting themselves with gradually paring down their columns and lengthening the spans of ceilings until the practical results of a few buildings tumbling about their heads convinced them that the ultimate strength of the materials had been reached. In more modern times the experiments have been conducted chiefly on paper, and mathematicians have successfully figured to a fraction of a pound the ultimate resistances of building materials, but with the curious results that the columns and beams yearly grow heavier and heavier to correspond to new laws and safer constants, though the theoretical strength remains the same. Mr. Cousins's recent work [1] is in the line of progression, boldly claiming that the ultimate and the elastic limit strength of beams and columns is computed from the ultimate and elastic limit compressive and tensile strength of the material by means of formulas deduced from the correct and new theory of the transverse strength of materials. The first general impression of the work is exceedingly satisfactory. It starts out by frankly admitting the difficulties of the accepted theories of strains, and proceeds to rationally investigate causes and effect. But within less than a dozen pages the difficulties begin by the introduction of the differential calculus, that triumph of the engineer and the despair of the architect, into the determination of a lever-arm. Take so simple an equation as this:

$$\int_0^{x_t} \frac{Tx^2}{xt} \cdot bdX = \frac{Tbx^3}{3x_t}$$

It is doubtful if a dozen architects in the country could make head or tail to this, and still more doubtful if any of them would ever try. And so on through the book. It has excellent material, logical reasoning and exact deductions, but so encumbered with unnecessary mathematics that the only beings who could apply the knowledge it contains would be those whose building operations are confined to paper castles in the school-rooms of our higher colleges. Nor are the results commensurate with the efforts. A number of tables are given of the computed and experimental strengths of columns of various sorts, a portion of a single one of which will show that even this work has not solved the problems exactly. Thus, regarding the strengths of hard-pine posts of various sizes, the crushing strengths are given as:

Computed.	Experimental.
344,822 pounds.	409,000 pounds.
100,584 "	97,330 "
231,516 "	199,830 "
249,253 "	281,000 "
170,800 "	126,350 "

Of these results of computation, as compared with actual tests, the theory gives a strength of 32 tons, or 15.6 per cent too small in the first experiment quoted, and 22 tons, or 35 per cent too large in the last. On the whole, we would prefer an empirical formula. After all, why should our abstruse mathematicians bother themselves so tremendously about producing an exact equation, when it is so very much simpler to actually crush a column or break a beam and totally disregard all theorems? No one pretends to have the slightest confidence in any theory of strength which is not substantiated by actual experiments, and, though the author of the work in question has struggled bravely, and has taken an evident satisfaction in the resulting complications, we question whether a return to mediæval methods would not be much simpler, and, on the whole, quite as satisfactory.

[1] "*A Theoretical and Practical Treatise on the Strength of Beams and Columns*," by Robert H. Cousins, C. E. New York and London: F. & F. N. Spon.

A collection of articles contributed at different times to the columns of *The Blacksmith and Wheelwright*, and covering nearly the whole range of blacksmithing from the simplest job-work to the most complex hand-forgings, constitutes the basis of a work [2] which is so evidently written for specialists and mechanics that it can have only an indirect interest to architects and amateurs. The volume in hand is marked so as to give the inference that a second one is to follow. If some one could devise a work which would arouse in our modern blacksmiths a little of the spirit which animated the old forge-artists of past times, it would have a meaning and a mission which every one could appreciate. The blacksmith, as an artist, has ceased to exist. Every architect knows how difficult it is to obtain really good forged-work, however simply designed: for between the file, the emery-wheel and the varnish-pot, nine-tenths of our wrought-work loses all of its artistic effect; and the hammer, which, though generally thought of as a rude and primitive instrument, is really in some of its uses a very refined one, has, in the hands of our modern workmen, been used merely as a tool, with no thought of its artistic possibilities. Our author recognizes this fact, but deplores it rather as a mechanical than an æsthetic failure. However, the book is all it starts out to be, and, though rather gossipy in detail, would make a mechanic the better for the reading of it, if only by teaching him to intelligently consider his tools and their possible application.

At hardly any period in the world's history has brick been used so freely for building purposes as at present and at no time with so little real artistic success. This is made apparent in perusing the book before us, [3] which, as its very lengthy and much *et-cetera-ed* title informs us, is a compendium of all that relates to brick and terra-cotta. One does not look for a great deal of artistic information in a practical treatise, especially when the work is written from the standpoint of the commercial manufacturer; but the very slight attention given to even so important a feature as ornamental tiles, and the almost total disregard of the possibilities of brickwork, would seem to indicate a corresponding attitude on the part of the general run of manufacturers which does not speak very well for the standard of national taste. At the same time, a book which takes up the history of brick-making, tracing the manufacture to its origin about the delta of the Nile in the time of the early pyramid-builders and carrying the lines of growth down to the present day, is certain to contain within its 478 pages, a great deal that would interest every one, and from which the inferential lessons of artistic growth and development, which the author has apparently carefully avoided, may be gathered by those who see in brick something more than a merely constructive material. Only in comparing the tile manufacturers of to-day, does the author draw out any of the causes of success or failure. Bostonians are inclined to pride themselves on the success of the Chelsea Tile-Works and to sometimes congratulatingly assure themselves that such artistic triumphs could have been possible only under the æsthetic influences and appreciation which are peculiarly Bostonese. But our author recalls the fact that Mr. Low was an artist before the Chelsea Tile-Works was thought of, having studied several years in the ateliers of Couture and Troujou, and that upon such a foundation he added a long experience as a potter, so that when his peculiar ideas began to assume a marketable form, they were the product of neither an irrational enthusiast nor a mechanical, commerce-serving tradesman, but of a practically artistic manufacturer, who was able to bring about and maintain the nice balance between artistic inspiration and mechanical execution so essential to all work of this character. The author fails to make the obvious application in this case as regards brick and terra-cotta; namely, that if our best brickwork is still only slightly above the commonplace and most of our terra-cotta patterned after the absurd American Gothic style of fifteen or twenty years ago, it is because the manufacturers, though often the best of mechanics, have never availed themselves of opportunities for such artistic training as the Lows have found so valuable as well as remunerative.

This must not, however, be construed as a condemnation of the

[2] "*Practical Blacksmithing*," by M. T. Richardson, editor of *The Blacksmith and Wheelright*. New York: Published by the author.

[3] "*A Practical Treatise on the Manufacture of Bricks, Tiles, Terra-cotta*, etc., including bricks, drain-pipe, fire-clays, terra-cotta, tiles, etc.; comprising every important product of clay employed in architecture, engineering, the blast-furnace, for retorts, etc., with a history of the actual processes of handling, shaping, burning, enamelling, etc., with descriptions of machines, tools, kilns, etc.," by Charles Thomas Davis. Second Edition, thoroughly revised, with 217 engravings. Philadelphia: Henry Carey Baird & Co. Price, $5.00 post-paid to any part of the world.

book in question. It contains a mass of valuable information, well-arranged, thoroughly cross-indexed and fully illustrated, which should be of interest to every one who has had the slightest acquaintance with the subject, while the exact technical details of the various manufactures would be of value to practical workers in clay.

IF a French student of architecture ever buys a book for himself — and the students we have been brought into contact with have been much like American students, that is, believers in the supremacy of the divine afflatus which inspires their own supposed genius — it is pretty sure to be a copy of "*Vignole*," second-hand and mutilated it may be, but still serviceable, and this he thumbs and mulls over until, at least, he has passed the entrance examination for the Ecole des Beaux-Arts. Once admitted to the School he disregards more and more the lessons he has memorized, tries experiments of his own, invents new combinations, but through all his changes and novelties there is a mental or an actual reference to his guiding friend and chosen adviser, "*Vignole*."

It was a useful work that the great Italian architect Giacomo Barozzi, of Vignola, undertook in his youth when he measured the monuments of antiquity still left in Rome and reduced his results to a system of rules which have practically controlled the use of the five orders of architecture from the sixteenth century to our own day. Many editions of his famous work have been published, and in public and private libraries the cumbersome folio edition is no rarity, but it is so unwieldly that in the same library is often found the cheap French lithographed edition, the smaller size of which makes it a more serviceable assistant that its more handsome neighbor. But even this is too large for constant use, and architects who, owing to the frequent changes in architectural fashion, grow rusty as to the number of members in a Corinthian architrave and doubt whether the dentil-course comes above or below the modillions would be glad to have a smaller book that can lie on the corner of a drawing-board within easy reach, while it does not cover up the work or get in the way of the constantly shifting triangle.

Such a smaller edition has at length appeared in the shape of a reprint and translation of the edition of 1832 (an edition which is said to be one of the finest that has ever been issued), and the very moderate price at which it is sold should cause every one to add one or more copies to his office library. This little work does not profess to contain all the plates of the original, and the translation is rather a condensed paraphrasing than a literal version, but it is all the more useful for preserving the kernel while rejecting the husk.

The plates are excellently reproduced and the measurements in spite of their occasional minuteness are quite legible. It is rather a pity, that while the translators were at work some one did not suggest to them that they might materially add to the value of their book by incorporating in it a corresponding series of plates, giving the composition and measurements of the Greek orders.

SOCIETIES

THE T-SQUARE CLUB OF PHILADELPHIA.

A REGULAR meeting of the T-Square Club was held at the office of Brown & Day, architects, on Wednesday evening, December 4.

The subject of the evening's competition was "A Music Pavilion in a Park," to seat thirty musicians. Plan and perspective required. Drawings were contributed by Messrs. Hayes, Jamieson and Noland, whose sketches won first, second and third mention respectively, and Yarnall, Hickman, Bancroft, Milligan, Keen, Brooke and Dacey.

The following new members have been admitted to membership since the last regular meeting: George Nattress, Frances W. Caldwell, John Hall Rankin, Eugene Sansom, Crawford Coates, H. Peale, Jr., William Loyd Titus, Arthur Cochran, and W. D. Goforth.

The subject of the next competition is "A Design for a Finish to the City-hall Tower." Required a perspective view from the street.

LOUIS C. HICKMAN, *President.*
G. C. PARMENTER, *Secretary.*

THE ROCHESTER ARCHITECTURAL SKETCH-CLUB.

THE Rochester Architectural Sketch-Club, which now consists of fourteen members, held its annual election of officers, October 7, with the following result: *President*, Claude F. Bragdon; *Vice-President*, William H. Barnes; *Secretary and Treasurer*, E. S. Gordon, 50 Trust Building. In the November competition of a "Metal standard for a Piano-lamp," the first place was given to C. F. Bragdon, second place, E. S. Gordon, second second place, F. H. Beach, Jr., third place, W. M. Perrin.

"*The Five Orders of Architecture.*" By Giacomo Barozzi of Vignola, Translated by Tommaso Juglaris and Warren Locke. Boston, 1889. Price, $1.00.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

LESSONS FROM THE BOSTON FIRE.

BOSTON, MASS., December 12, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs, — Lest the adoption of safer methods of construction should be retarded by erroneous statements, you may, perhaps, permit me to correct some wrong impressions which you have given in your editorial comments upon the buildings that were destroyed in the recent fire in Boston.

In your paper of December 7th you refer to the Ames Building, planned and erected by the late H. H. Richardson, which stood on the curve made by the junction of Bedford and Kingston Streets, opposite the building in which this destructive fire originated, as "*an excellent example of the slow-burning method of construction.*" You then remark upon the rapid destruction of this building by fire in such a way as to throw a doubt on the merits of the so-called slow-burning method.

My own judgment is that it would have mattered very little how the Ames Building had been constructed so long as the very large windows, unguarded by any fire-shutters, were exposed to the fire on the opposite side of the narrow street. Had it been constructed wholly of brick and iron exposed to heat in what is commonly called a fireproof method, and yet been filled with the ordinary quantity of combustible merchandise, I have no doubt it would have been as completely and speedily destroyed as it was under the actual conditions. The destruction of this building, as I am informed, began with the *iron* roof.

I beg to say that, in the judgment of those with whom the so-called slow-burning method of factory-construction originated [not myself, but my predecessors and coadjutors], this building was so far from being "an excellent example of slow-burning construction" as not to have been any sort of an example. Mr. Richardson himself would, I think, have been the last man tosustain your description.

I confess that when such inaccurate statements are made in a journal assuming to represent the profession of architecture, they may lead those whose business it is to try to prevent loss by fire to become almost hopeless of any effective support from the profession.

The single element in this building which was taken from the plans of those whose business it is to construct slow-burning factories was the so-called "factory-floor," consisting of plank and boards laid solid over heavy beams set wide apart, without any ceiling or sheathing underneath. There were two thicknesses of asbestos paper between the upper and under floors, but, as asbestos is a pretty good conductor of heat, and since asbestos paper is not a good waterproof material, we do not advocate its use in factories except for the purpose of preventing dust from passing through the cracks. As a fire retardent it has very little efficacy.

Mr. Richardson adopted this floor:

1. On its merits as a floor, and not as a fire-stop.

2. Because he approved it as an artist, and considered it more consistent with the specific design of this particular building than the ordinary floor laid on joist or plank, one or two feet on centres, plastered underneath.

Aside from this floor, the construction of the stairways and the stair partitions; the shape, size and disposition of the windows; the lack of protective apparatus and the want of any provision for approach to the building in the rear or upon the roof; and yet, more than all else, the shape, material, covering, construction of dormer windows and every other element of the roof, were utterly inconsistent with the very elementary conceptions of slow-burning construction.

In reference to the roof, I am informed by those who observed the progress of the fire that at a very early period the expansion of the iron forced the upper part of the wall outward, and threw it, with the dormer windows, into the street. The remainder of this iron roof then crashed downward through the building before any flames were observed in any of the lower parts. This observation has since been sustained by the officers of the Fire-Department.

I can, perhaps, make this case more plain by treating the problem of placing a slow-burning commercial building upon a lot corresponding in shape, size and surroundings to the lot upon which the Ames Building was erected. I will change the conditions only by assuming that the lower story of the proposed building is to be used for a show-window in a retail shop, and will also change the location so as to submit the possible conditions of surrounding buildings as they might be found.

We may suppose that there is a vacant lot of triangular shape on a curved junction of Washington Street and some other street, upon which a building of triangular shape, rounded on the front, is to be placed. We will assume that all the light is to be taken from the front on this curve, that there can be no windows on the other two sides of the triangle, and that there is no room for easy access or for

light at the junction of the two sides of the triangle in the rear. The owner gives the following instructions to his architect:

"You are requested to make a plan and elevation for a building to be put on this lot, which shall be suitable, safe and not of unusual cost. The rent which can be obtained will not warrant the excess of cost for a strictly fireproof structure; it is to be built on the slow-burning principle, and is to be guarded according to the method of factory-construction, consistently with the rules of that system."

We will next assume that the architect first views the surroundings in order to determine what dangers may be incurred from buildings standing near. It might happen that he would find a large building on the other side of a narrow street, of which the front rests on square iron posts. These posts are supported in the basement upon granite columns of about the same size. Upon these posts, which are over twenty feet apart on centres, rest girders of cast-iron, making open spaces for show-windows eighteen feet in the clear. Above the first story he finds four or five stories of granite or brick resting in part upon the posts, but in greater measure upon the cast-iron girders. He finds that the floors within this building are also supported on cast-iron posts, of which he does not consider the offsets sufficient to give a suitable rest for the ends of the beams. He also finds that the floor-joist extending from the first line of posts toward the wall are over twenty-five feet in length, and that the outer ends rest upon the same cast-iron girders by which the granite or brick walls are sustained. He makes a rough-and-ready computation, and he finds that if these floors are loaded with the average weight of merchandise, each cast-iron girder will be called upon to sustain a weight of nearly one hundred tons, or of about ten thousand pounds, to the running foot, mostly the weight of the wall. This architect, being familiar with the treacherous nature of heavy iron castings and with the yet more treacherous nature of both cast-iron and granite when exposed to fire, reasons to himself somewhat in the following way: "If a fire ever occurs in that basement, the vent for the heat will be at the basement windows, just above the level of the sidewalk, where the square iron posts rest on the granite blocks. The firemen will be unable to protect these blocks; the corners of the granite will, therefore, be very quickly converted into sand by the heat, and perhaps in thirty to sixty minutes the top of these granite blocks, which are less than two feet square, will be rounded off so as to no longer give a sufficient support to the square iron posts which rest upon them." Again he may say to himself: "If the fire occurs on the first floor, that cast-iron girder will surely be cracked, bent or broken in a very short time." Or he may again say: "If any of these inside posts give way, or if the beams which are insufficiently supported drop from the posts, the construction is so badly devised that each post and each girder will probably prove to be a key on which the stability of the whole structure depends; if any one gives way the whole building may come down at once."

He next estimates the direction of the forces which will be in action in case of such a mishap, and he then says to himself: "Within thirty to sixty minutes after a fire gets well underway in that building those walls will be pushed outward; they will fall completely across the narrow street; they will then block the street. After that there will be no possible approach for the firemen on the front to the building which I am to construct. It must then take its chance without the service of the fire-department, unless it can be guarded within or approached either by way of the roof or at the point of the rear angle from the other buildings alongside or behind it." The building opposite the Ames Building fell in this way, as I am informed and as I had reason to suppose it would, if a considerable fire occurred in it.

Perhaps the architect advises with the fire-engineers, and, if they have confidence in him, they may tell him that they look upon this building with such distrust and dread that they will neither order their men to enter it nor to attempt to cope with a fire in it except from a safe distance.

Having thus informed himself of the conditions to which he must adapt the construction of the building ordered so that it may be made suitable and safe at a moderate cost, the architect then proceeds to make his plans, and not before. His necessary conclusions are as follows:

1. Nothing but brick can be safely made use of for the outer wall of this building. Fire-brick of the same size as common brick, bonded into the wall of which they form the face, preferred to any other kind.

2. Unless the windows are so constructed as to disclose the least amount of wood on the outside, and unless they are guarded within by suitable fire-shutters so as to keep fire out of the building, it will be destroyed by the combustion of the contents, of whatever material it may be constructed, when the opposite building burns.

3. Since the spaces in the lower story must be large enough for show-windows, they cannot be guarded by shutters; an outside fire must therefore be cut off inside the show-case, of which the windows make the front.

4. The roof must be flat or nearly so; it must be guarded by parapets especially on the front; it must be fitted with roof hydrants from which heavy streams of water can be thrown upon neighboring buildings.

These points being decided, the true methods of slow-burning construction may then be adopted as follows:

1. The beams to be of heavy timber, set wide apart, either solid or in two parts bolted together with a space for ventilation between; the main floor of three-inch plank grooved and splined; next a coat of cement-mortar over which the top floor is to be laid. In place of the cement-mortar, two thicknesses of paper or sheathing-felt with asphalt between may be laid between the plank and the top floor. If either mortar or asphalt paper are thus placed, the centre lines of the plank should be indicated so that the nailing of the top floor may be on that centre, to prevent any effect upon the nailing from the swelling or shrinking of the plank.

2. The elevator is to be in a fireproof shaft at the left on the front side, surmounted by a thin glass skylight and fitted with fire-doors made of two thicknesses of wood encased in tin, automatic in their action. Wire netting is to be placed under the glass.

3. The stairway may be on the other side; it must be encased in brick; the doorways protected by fire-doors surmounted by a sky-light glazed with very thin glass, with wire netting underneath; the stairway carried to the roof.

4. There must be no opening from one story to another except by way of the elevator, the stairway, or by the pipe-chamber in the rear to be hereafter described.

5. If the utmost security can be afforded, the underside of each floor may be plastered with rough plastering on wire-lathing following the line of floor and beam. This plaster must have no skim-coat on it, lest the air should be excluded from the heavy beams, and they should therefore be exposed to the fermentation which is commonly called dry-rot. If it is necessary that the ceilings should be sheathed rather than plastered, the sheathing shouldly be nailed solidly on the underside of the plank. The walls of such buildings should not be furred; if plastered, the plaster should be put directly upon the brickwork. If it is necessary to sheathe walls in the lower stories or in show-rooms, the space between the furring-strips should be plastered, and the sheathing should be nailed close against the plastering. This sheathing may be painted but should not be varnished with the ordinary combustible varnishes.

6. As the show-window is to be used for the display of goods, no light is required from it; it is therefore to be backed by a brick wall four or five feet within the building, and ceiled overhead with fireproof material; to be entered by a suitable fire-door from the entrance porch inside the outer door, and outside the inner fire-door of the building proper, which is to be closed at night. This show-case may be stopped with incombustible material below the ceiling of a high story, so that some light may be taken from shutter-guarded windows.

7. Above the first story, wall-spaces and window-spaces must be equal so that every window may be fitted with an automatic fire-shutter placed on trolley tracks, held open by fusible links which will yield to the heat of a fire passing through the glass of the windows before the glass is broken, so as to assure the automatic closing of the fire-shutters when not closed by hand.

8. In the rear angle, behind a suitable fire-wall, all of the heating-pipes, drain-pipes, electric-wires, and the water-pipe from the roof are to be placed in a shaft.

9. Room may be given within this shaft for a fire-escape, or one may be placed outside communicating either with a subway to the street or with some other building, if there is no other means of access to the rear. From this rear shaft access may be had to the roofs of adjoining buildings; or the firemen may obtain access to this building from such roofs, as well as to the roof itself.

10. The roof is to be constructed like the floor, of thick plank, preferably covered with copper, pitched slightly to the rear so that the rain-water will drain off through the water-pipe, which being placed next the heating-pipes inside the building will not be liable to become clogged by freezing. This roof is to be surrounded with parapets, and furnished as above stated, with roof hydrants connected either with the high service; or, if the building is large enough, to be served by a powerful steam-pump in the building itself. If possible, this pump should draw water from a well or reservoir unless the city water-supply and pipes are very large.

11. Asbestos paper or felt is not accepted as the equivalent of cement-mortar or asphalt paper because it is neither a good defence against water nor heat; asbestos being merely an incombustible material which partially serves as a non-conductor of heat when in a loose and fluffy condition holding entrapped air; but which, when compact, is a rather good conductor, being quickly heated red if exposed to a moderate fire; as air passes through the interstices of asbestos, wood may be much more surely protected from heat with tin than with this material, yet better with plastering on dove-tail lath or on wire-lathing.

12. Such being the necessary conditions, the artistic skill of the architect must be limited to the color and disposition of the brick, to the use of terra-cotta, and to the decoration which may be put upon flat surfaces in the treatment of the interior, without painting the heavy beams or making use of combustible varnish of any kind upon the woodwork.

13. The tops of the windows must of necessity be square, because the round-top window gives the least light at the most important point; the top of the square window being carried up flush with the ceiling of each room in order that the top light may be most fully distributed within.

14. Heavy wooden posts may be made use of, preferably square posts of large size. Iron posts may be adopted under the following conditions: if an iron column or pier is used in the external wall it should either be filled-in with hard brick and be of sufficient size to hold a brick pier capable of sustaining the load; or the iron post should be made double, the inner column calculated to carry the full load; the space between the inner and outer column filled-in with at least one inch of plaster-of-Paris; or else some of the composite columns may be used in which the iron is strong enough to sustain the whole load, protected on the outside with incombustible material of a suitable kind.

15. If it is desired to give absolute stability to the front wall so that it may, perhaps, stand unimpaired even if a fire within the building should get through the floors, a line of posts may be placed four or five feet away from the window, upon the wall by which the show-window is backed. Between each line of posts and the wall itself, an alleyway may be constructed, with the floor so framed as to become a horizontal truss, entirely separate from the remainder of the floor; these posts and

this alleyway, being made nearly fireproof, would become an inner buttress sustaining the wall on a base equal to that of the wall and the width of this alley, at whatever width may be determined. The floor within might then fall away from these posts without straining either the trusses, the posts or the wall itself.

16. Given access to this building from above or from the rear through adjacent buildings, firemen could safely enter it, and being guarded from the heat by the shutters, as the workmen in the Tebbitts Factory, in Lynn, were guarded, they could fight the heat coming through the cracks from the fire opposite; they could also operate upon the fire from the roof or through port-holes which are sometimes constructed in cotton storehouses for the purpose of putting the end of a hose-pipe in or out, without exposing the firemen to any considerable amount of hazard. Such a building as this, placed opposite a dangerous building, would thus become a safeguard to the neighborhood in place of being an additional menace, and from it the stone and marble shams which screen but do not protect so many cellular wooden structures within the limits of the City of Boston and elsewhere might be protected from above, if any such were near.

The problem of guarding very large windows in lower stories without putting a brick wall behind them a few feet distant, is one so foreign to mill-practice that I hesitate to consider it. In narrow streets the necessity for light or the requirements of trade may make it incumbent upon owners to insist upon such windows being incorporated in the plan.

The only theoretic solution which the writer can offer is as follows:

1. To guard the windows with rolling-shutters made of steel slats, so thin as not to be liable to warp: such shutters would probably exclude flame and sparks in some measure. Behind these shutters heavy blankets might be kept upon permanent rollers. Such blankets having been treated with antiseptic and fire-retardent materials could be kept free of moths, and if wet by the sprinklers would be a very great safeguard.

2. To place one line of automatic sprinklers back of these shutters, and so adjusted as to throw a heavy shower of water upon them, the rest of the floor being protected with automatic sprinklers of the common kind.

3. To permit no passage from such lower floor to the upper floors to exist, unguarded by fire-walls at the stairways and elevator-shafts all doorways guarded by suitable fire-doors.

I have thus attempted to give a description of a complete slow-burning building so placed as to be exposed to exceptionally dangerous conditions. On a different lot on a wide street, accessible both in front and in the rear, the extreme precautions named in the foregoing description might, in part, be omitted. Unguarded windows might perhaps be tolerated, although they are never safe if there are combustible buildings, and especially very high buildings, near by.

The advantage of the floor-construction, as compared with the ordinary joist and ceiled floor is, that there are no cavities in which rats and mice may build their nests of materials which are subject to spontaneous combustion; also because there is no serious obstruction on such a ceiling to the clean sweep of water thrown by the hose-pipes between the timbers. Also that it is slow to ignite and slower to burn.

I have only described what is the common practice in the construction of every cotton or woollen factory, paper-mill, machine-shop, or other building which comes under the supervision of those whose business it is to prevent loss by fire.

The rules which I have laid down are consistent with the construction of a building of the customary size of modern cotton-mills, at a cost above foundations of from seventy to eighty cents per square foot of floor, or about four dollars per square foot of ground five floors high, about twelve feet each story above the foundation; automatic-shutters counted as extras. If this mode of construction is not superseded in city buildings by the cohesive arch or dome represented by the Guastavino Fireproof Construction Company, it may be worthy the attention of the owners of the commercial buildings which may be placed on the lots which have been cleared by the recent fire, or elsewhere.

By comparing these specifications with the conditions of that very beautiful work of art known as the Ames Building, you will, I think, justify me in calling upon you to revise your statement that that building might rightly have been considered "an excellent example of the slow-burning method of construction."

The question is often asked why many of the existing hazards of fire in the buildings which were constructed under the old Building Law, and also existing to some extent in buildings constructed under the present more complete Act, may not be avoided in future construction by amendments to these Acts.

There are amendments which perhaps ought to be made, of a somewhat general nature. More frequent fire-walls are required, both to sustain the outer walls of large buildings and to prevent the extension of fire within them; but too much reliance ought not to be placed on statute protection. Almost all the dangers of fire are due to a want of perception on the part of the owner or occupant of the necessary conditions to which he must subject himself unless he chooses to run the risk of the destruction of his property or the interruption of his business by fire. If such an owner elects to trust to a policy of insurance to compensate him in money when the fire occurs which he himself has caused by want of attention to the conditions of safety, then the safer method of construction may possess no interest to him, and he can only be prevented from endangering his neighbors by compulsion of law, or by such an appeal to his cupidity as may suffice to prove to him that no man of common sense, however penurious, can afford to place himself in such a position.

There are many architects who are now entitled to the name, men who are not only masters of design, but who also comprehend the art of building and the elements of engineering which are necessary in ordinary practice, and if owners and occupants did not insist on meretricious art; or were not captured, misled and humbugged by skilful designers who make more or less artistic pictures of elevations, but who have no comprehension of the art of building, then these true architects might have, or would have made Boston and other cities, a great deal safer than they are now.

Commercial buildings may be constructed consistently with the rules of safety, and even more suitably for the purposes for which they are used, at as low a cost, if not lower, than the sums which have been expended in the construction of the conspicuous examples of combustible architecture — like a large part of the buildings which now expose this city, and nearly every other, to the danger of a great conflagration.

The prices of typical factory buildings have been reduced to rules. He who proposes to build a factory, having estimated the cost of his foundation, may be absolutely certain that any plan submitted to him by architect or builder, which calls for an expenditure on a building of the average size, five stories high, of more than four dollars per foot of ground covered, or eighty cents per square foot of floor, ought to be rejected unless he is prepared to spend money unnecessarily.

The factory construction may be adapted to commercial warehouses, subject to such additional cost as may be necessary in order to finish the interior, to put up partitions, and to prepare the building for its commercial purpose. The load on the factory floor is a light one, and, therefore, each floor in the commercial building may require special computation with respect to strength. But there is an absolute basis of average cost for the factory building, which may be reduced considerably below the standard named, in many places; the variation being in the cost of brick, timber and labor. Eighty cents per square foot of floor may be considered the maximum cost of the most substantial factory, above the foundation, in this section of the country.

It would seem to the uninstructed mind that on such a basis of fully established cost in one class of buildings, the variations due to size and to difference in interior work might also be established in commercial warehouses, so that any intelligent owner of property would be himself fully capable of passing upon the plans and estimates submitted to him by architects and builders. It often appears to the uninstructed mind that the customary method is quite the reverse of this. It certainly is in respect to many buildings aside from commercial warehouses. Committees are very apt to give their attention at the beginning, mainly to the elevation and design of churches, hospitals, school-buildings, and the like, without much regard to the manner in which this outer shell is to be filled with the combustible material so as to be put to use. Perhaps, for this reason we burn one or two churches every week on the average — the destruction of those which are called stone churches being apt to be the most complete; also an average of two hospitals or asylums every month, with an occasional loss of life; and more than one hotel every day; while an occasional great conflagration, like that which occurred on Thanksgiving Day, brings up the average price of combustible architecture for the year 1889 to the level of preceding years — otherwise it might have been inferred that greater improvement has been made in the art of building in cities.

It is possible that an incident like this, which may be repeated at any moment not only in Boston but in many other cities, will lead to a more intelligent consideration of the purpose to which commercial buildings are to be put, and may possibly lead to a more adequate study of the dangers which may be incurred from bad and dangerous buildings already standing near vacant lots, before the architectural design of the buildings to be put upon the vacant lots is determined upon.

It is doubtless desirable that art should be a principal motive in architecture; but is not art misplaced when applied to such buildings as the Ames Building under the conditions of the surrounding neighborhood; was not Hunt's genius misapplied when he put his pictures upon the unstable walls of the Capitol at Albany?

There is a place for everything. The builders of factories have, to a certain extent, been obliged to treat their buildings without much assistance from the profession of architecture, because of the difficulty which has existed, until very recently, in persuading the architect that he must be something more than an artist, in order to be competent to construct either a factory or a commercial building.

EDWARD ATKINSON.

ENGINES AT THE BOSTON FIRE.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Allow me to notice, as a matter of abstract scientific interest, a detail which you quote from the received account of the late Boston fire. You say in your summary of December 14, "Solid streams of water from the hose turned into steam before they entered the windows." This is the account of eye-witnesses, repeated without question by the papers; but I believe it to be impossible, or at least to convey an impossible idea. The water must have left the nozzles with a velocity of eighty or a hundred feet a second. With

allowance for retardation, it would have taken about two seconds to reach its highest point, exposed perhaps for one second to intense heat. Now water absorbs heat rather slowly, and it is safe to believe that no heat to which it could be subjected could turn a solid cylinder of water some two inches in diameter into steam in one second, or in two. We all know, however, that the upward stream from an engine at the end of its flight is disintegrated by the resistance of the air, and especially by wind, into a coarse spray. It would be easy for spectators, too excited and untaught for accurate observation, to mistake this spray for steam. Undoubtedly in this form the water would be rapidly evaporated, but steam is invisible until it becomes wet, that is, practically condensed. If anything was seen that looked like steam, this is the best evidence that the water was then unevaporated. The effect of such an action as is ascribed to the fire would probably have been to drink up the spray as fast as it was formed, thinning down the stream to a thread which would disappear in a point. If a competent scientific observer should declare that he had seen the streams taper away like melting icicles and end in nothing before they reached the building, I should say that this was more natural,—but that the smoke had probably obscured his view. The discussion is rather abstract than practical, but it may help support our confidence in the fire-engines. L.

NOTES AND CLIPPINGS

The Amines Process of Sewage Treatment.—A demonstration of a new system of sewage treatment, known as the Amines process, has just been given at Wimbledon, England. The experimental term has been since July last, and the existing works in connection with the sewage farm have been utilized. Ordinary lime is slaked and passes through a mill, mixed with water and receiving at the same time a regulated stream of "herring brine." The special feature of the process is this brine. The sewage as received is fluxed with this mixture of milk of lime and herring brine in the proportion of three grains of brine and forty-seven of lime to the gallon of sewage. The sewage as treated is passed into a well and thence directly into one of the precipitating tanks. Of these there are six, all auxiliary, and each of a capacity of 85,000 gallons. From the tanks the effluent is run off into the river Wandle, and the sludge passes by gravitation into the filter-house, where compressed air is employed to pass it into the filter-presses. Of these there are three ranges. The cake as taken from the presses is almost inodorous, while the effluent is clear and inoffensive to sight and smell. The population of area treated is 25,000. It is claimed that while it takes three-quarters of an hour to fill a tank the sludge will be precipitated in half an hour, ready to pass to the filter-house. Mr. Ellice Clark, M. I. C. E., the chairman of the company, stated that while they were prepared to accept any income that might be recovered from the sale of cake for manure, they did not take that matter into consideration as affecting the cost of the process. The position they took was that sewage must be got rid of in the most effectual form, and they claimed to do this at a cost of one cent to one and one-half cent per 1,000 gallons. The claim in the prospectus that the effluent is completely sterilized by the addition of three grains of herring brine and seventy grains of lime to a gallon of sewage is a very remarkable one, and we shall look with interest for the results of further trials on this point. If it turns out that herring brine really has this marvellous effect, every herring caught in future should be pickled, for the demand for this material in domestic and municipal sanitation will be immense, and cess-pools need no longer be dangerous or offensive. — *The Times, Lowell, Mass.*

Oxide of Zinc. — "In the whole world there are about 150,000 tons of the oxide of zinc made. The principal method used in the making is called the Belgian process. The ore is ground to a fine powder, like sand, and mixed with pulverized coal, in the proportion of one-third coal to two-thirds ore, to one-fourth coal to four-fifths ore. The coal is to take up whatever oxygen is given out. This mixture is then shoveled into a retort, where, by means of a coke fire, it is heated until it becomes a vapor. A strong draught is caused by means of exhaust engines and the vapor is drawn into a large pipe. Just as it enters it meets a stream of fresh air, which causes it to burn with more heat. Then through this big pipe which receives the gas from hundreds of retorts it is carried for a long distance; finally cooled down to a moderate temperature, it is forced into a large room into bags, three or four feet in diameter and thirty feet deep, made of cloth. The gas escapes through the meshes, but the zinc oxide is left in the bags. In making the regular metal which is used so commonly, the same mixture of ore and coal is packed in cylindrical clay retorts, about four feet long and a foot in diameter. These are heated to a fearful heat and the metal runs slowly out into a kind of funnel which is fastened to one end of the retort. The metal from several retorts is collected until about two quarts is obtained, when it is cast in sheets."— *Professor Harper.*

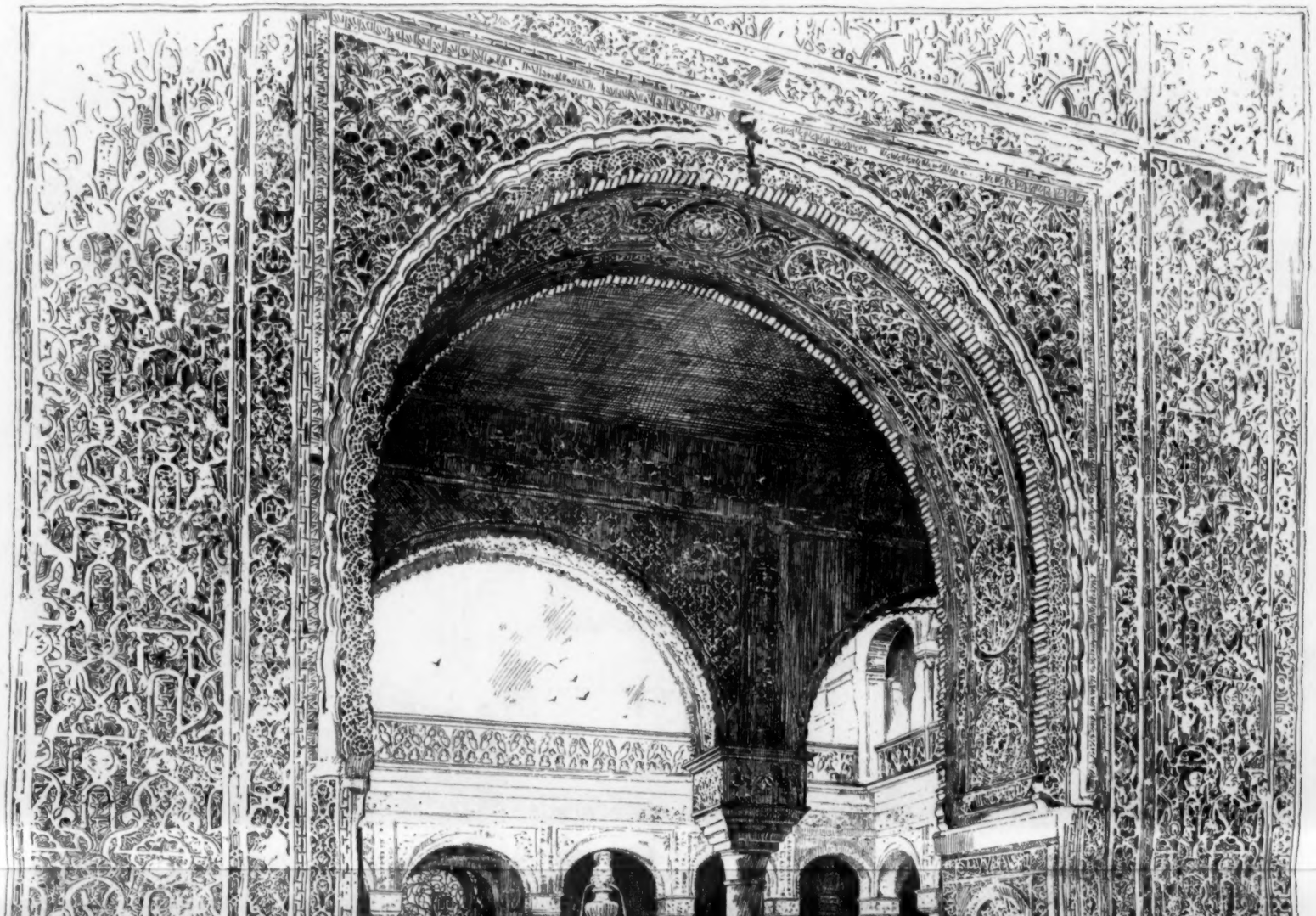
TRADE SURVEYS

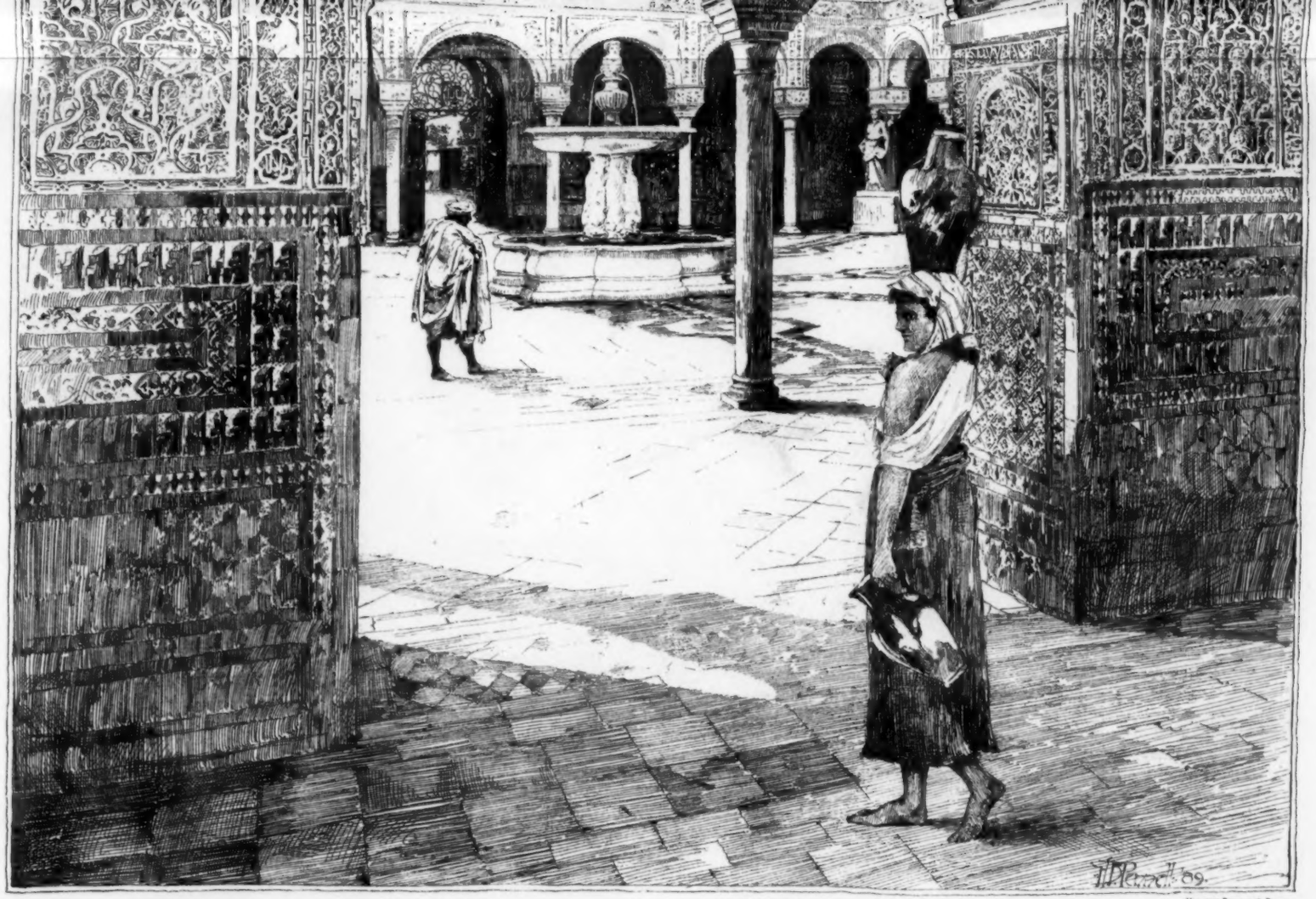
A recent estimate of projected railway construction for 1890 and 1891 puts the figures at about 30,000 miles. Much of this work has passed the preliminary surveying stage. The industrial boom that has spread over the country will probably stimulate railway construction, and the seven or eight thousand mile limit may be reached next year without difficulty. The announcements of new roads during the past three months go to show that a great deal of railroad building will be undertaken between now and next May. Besides the projected construction of roads ranging from fifty to two hundred miles in length, there are belt-lines passing through the preliminary stages, involving the outlay, according to two or three estimates, of seventy or eighty million dollars, and possibly one hundred million. Municipalities and county authorities in between thirty and forty States of the Union are contemplating liberal expenditures in the way of improved facilities for furnishing water, gas, electric-lights, cable-roads, public buildings and improvements of various kinds, all calling for large outlays of money and the placing of bonds upon the market. Agencies representing the bond-issuing interests speak very freely and encouragingly of the success attending the placing of this class of bonds, and of the prospects for placing the additional unloadings that are in contemplation. There will be an abundant opportunity for investment in this direction. It is learned by inquiry from parties representing foreign investors that much foreign capital is likely to be diverted into this direction, rather than into the buying up of well-paying manufacturing establishments and plants. Englishmen who have been endeavoring to invest money in this way complain that exorbitant prices are asked, and that negotiations in many instances have been abruptly terminated by naming prices which would not be named to any other purchasers. Most of these new bonds with which the country will be well supplied next year will pay six per cent, and will be bought at a discount. This policy may not be a wise one, but, whether it be wise or not, local authorities throughout the country intend to profit by the use of liberal loans. There is no good reason for apprehending any harmful results from this bond-creating business. Railway corporations are continually running into debt, and assuming heavier loads without a thought of untoward results. The newer sections of the country are filling up rapidly, and improvements above named are imperatively necessary. If they are not secured until the gradual accumulation of means will allow, then certainly must these municipalities and counties expect to remain in primitive conditions for a long time. The policy outlined is wise, and will be productive of excellent results. The purpose of referring to this money-borrowing crusade that is about setting in is to point out, in the first place, the opportunities which capital will have for earning good returns, and, in the second place, the necessity that will soon arise for the wisest possible financial or monetary system. These improvements will develop manufacturing interests and agriculture, and will bring into life a largely increased class of small and large traders, whose business it will be to effect the exchanges which the new army of wealth-producers will require. A column could be easily filled with announcements of important railway construction projected within the past three months. A very liberal estimate of the contemplated mileage would be 3,000 miles. A considerable proportion of this will be built in the South. One of the projected roads will extend from Kearney, Neb., to Galveston, Texas. A great deal of work is projected in Oregon and Washington. A dozen or more lines are to be built in Missouri and Kansas. In Arkansas, a 120-mile road will be begun within sixty days. Representatives of manufacturing establishments, electric-light companies, cable-road builders and iron and steel makers, who have been canvassing the country for business during the past two months, have been lately furnishing their employers and the public some very interesting information concerning the wonderful expansion of the country in every department of activity. The stories they tell of new work, and of extensions and of projections of a hundred kinds, are all very interesting to read and know. Their testimony, reduced to a few words, is simply this: that the producing capacity of the United States in all excepting a few lines will be fully taxed through the coming year. Among the exceptions which might be mentioned are the textile lines, but as to this there is doubt. Unsettled tariff duties put the woollen manufacturers at a disadvantage. A twenty per cent advance in cost of German hosiery, coupled with a great scarcity of foreign hosiery in the hands of American importers, is imparting a stimulus to the American hosiery manufacturing interests.

All kinds of cotton goods are selling at about the same price as last year, while cotton is a little higher; but there are signs of an advance in the commoner grades of cotton cloth. In the boot and shoe industry a strong and steady demand is keeping capacity pretty busy. In the clothing branch manufacturers are running to full capacity, but are obliged to watch the market very closely. The wool-using and wool-growing interests are not in harmony on the question of tariff duties. The dictators of our political policy recognize the urgent necessity of tariff reform, and a vigorous cutting down will be accomplished before the adjournment of Congress is reached. The iron trade is booming on both continents. In Germany prices are all "on the boom." Military and naval requirements are heavy. The most intense activity has been created, and the leading iron and steel works are full of orders for the greater part of next year. Such a prosperous condition of the iron trade as now exists in the United States was never known. Already, half the output of the Lake Superior mines for next year has been contracted for. From five to seven miles of coke cars leave the Counelsville region every day with coke. The bituminous coal-fields of the Alleghany Mountain region are crowded with orders, but competition is keeping prices down, and a grand soft-coal trust is now being contemplated for the purpose of increasing the price of coal 20 cents per ton. In the iron trade soft steel, Bessemer pig, nails and barbed-wire have all advanced. The present crude-iron production is over 170,000 tons per week, of which 118,000 tons is made in furnaces where bituminous coal and coke are used as fuel. Employers are somewhat concerned at the possibility of general labor strikes next year: First, on account of the improving trade conditions, and second, on account of the agitated question of an eight-hour day. Opinions differ very widely as to what effect the action of the federated trades will have upon labor in general. Striking is to be done in spots. Employers will scarcely know how to act in a coöperative way. The decision arrived at, and the reasons given for the decision, go to show that the movement is weak rather than strong. The Knights of Labor will not coöperate. The agitators have, by accident, chosen an opportune time for their demands, as in all probability the spring time of 1890 will be one of exceptional activity and promise. Furnaces and mills are blowing and roaring themselves hoarse; manufacturing establishments of all kinds are crowded with work to the verge of cheating Sunday out of some of its hours; railroad-managers are barely able to meet the exacting demands upon their facilities. Capital is stimulated to investment, and while margins are not large, risks are fewer and opportunities are more numerous. It would, therefore, seem that an organized attempt on the part of labor to demand an eight-hour day would have many things in its favor. The strongest point against the entire movement is the conservatism and common-sense, or more properly speaking, the *vis-inertia* of the great body of the American laboring people. The building trades will get the hardest blow; builders may find it advisable to yield the point in the larger cities for the time being, but equalizing influences will restore the equilibrium.

S. J. Parkhill & Co., Printers, Boston.

COPYRIGHT 1889 BY TICKNOR & Co

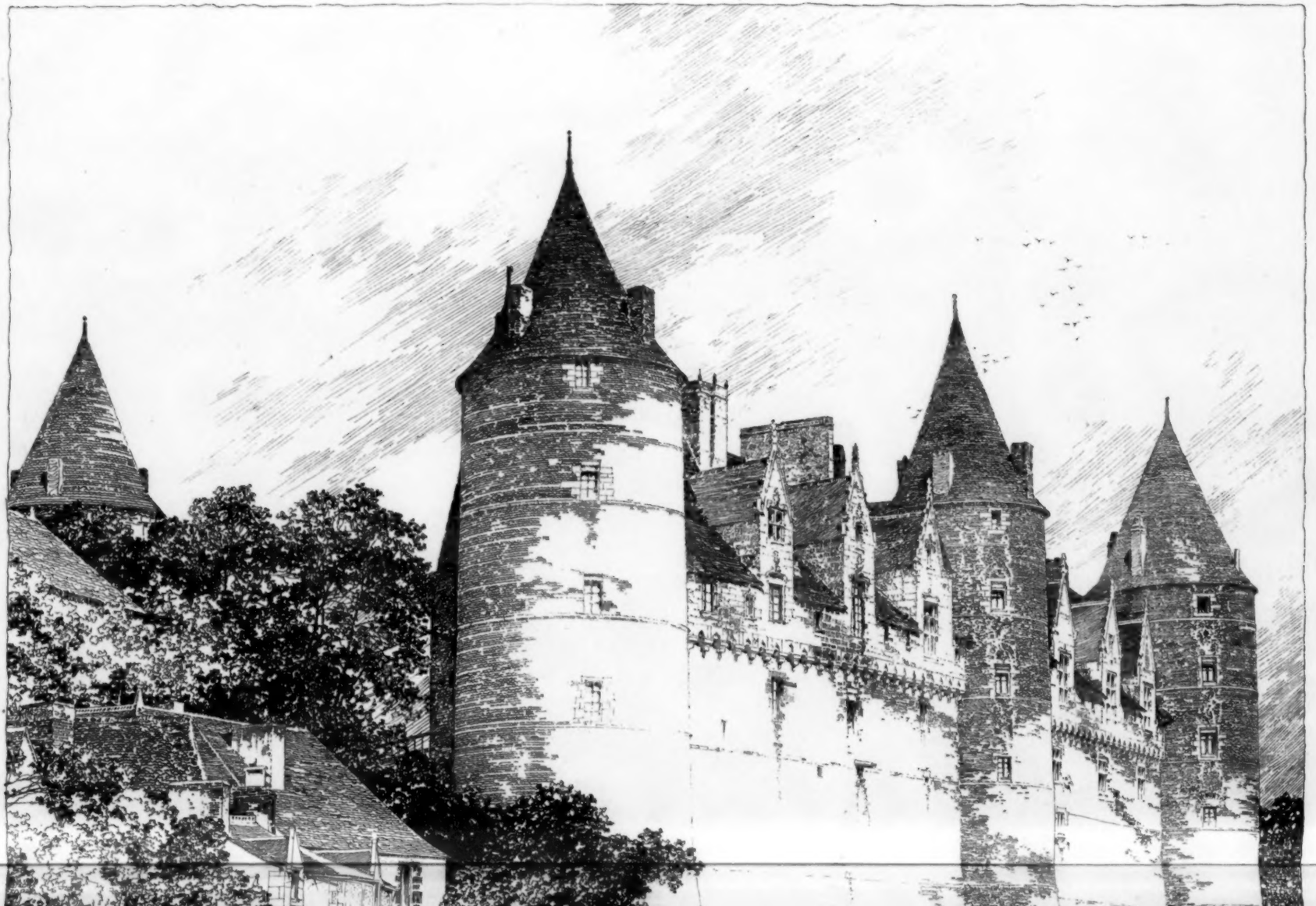


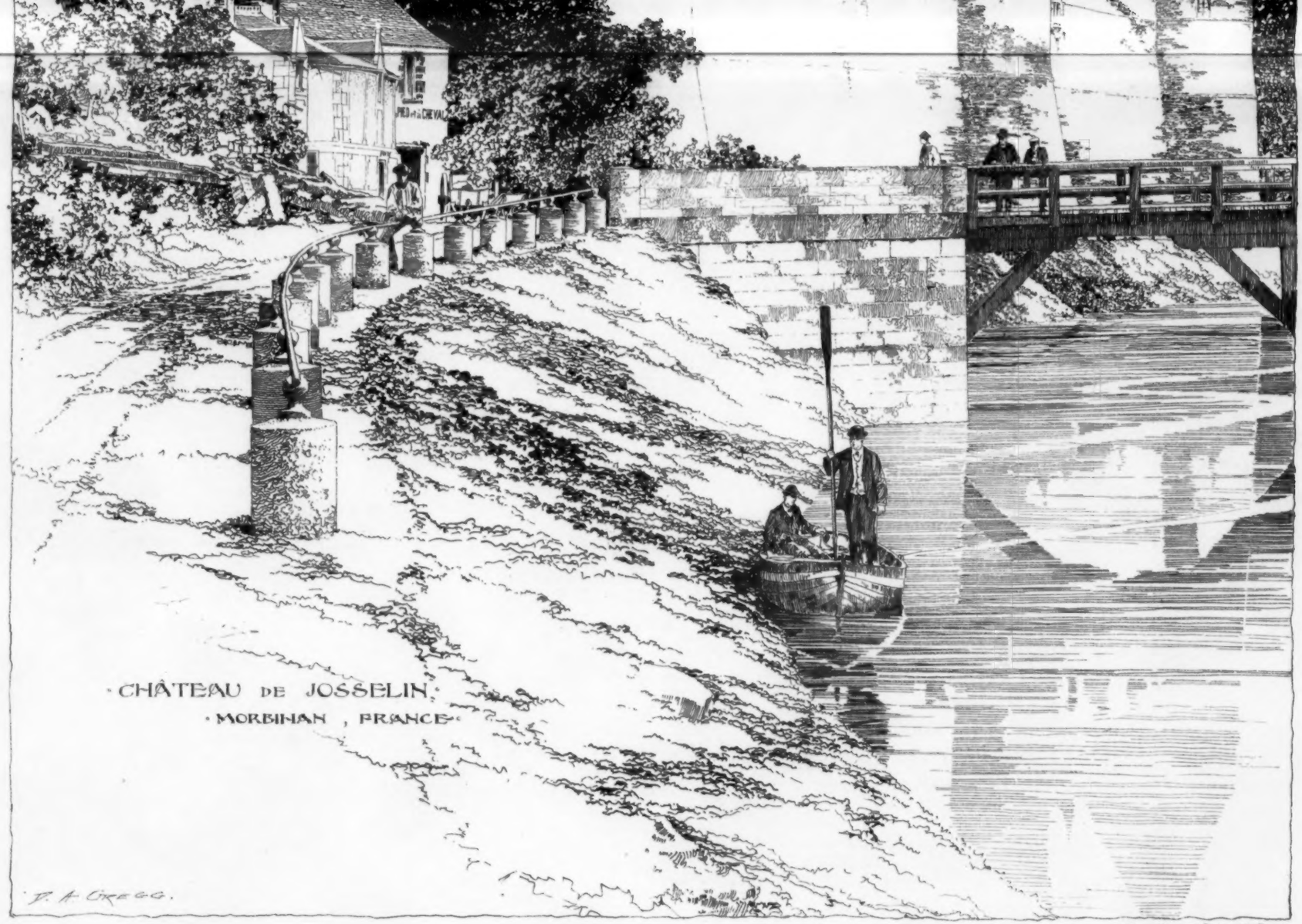


Halftype Printing Co. Boston.

CASA DE PILATOS, SEVILLE.
LOOKING INTO THE COURT-YARD THROUGH
THE CHAPEL ENTRANCE.

COPYRIGHT 1889 BY TICKNOR & Co



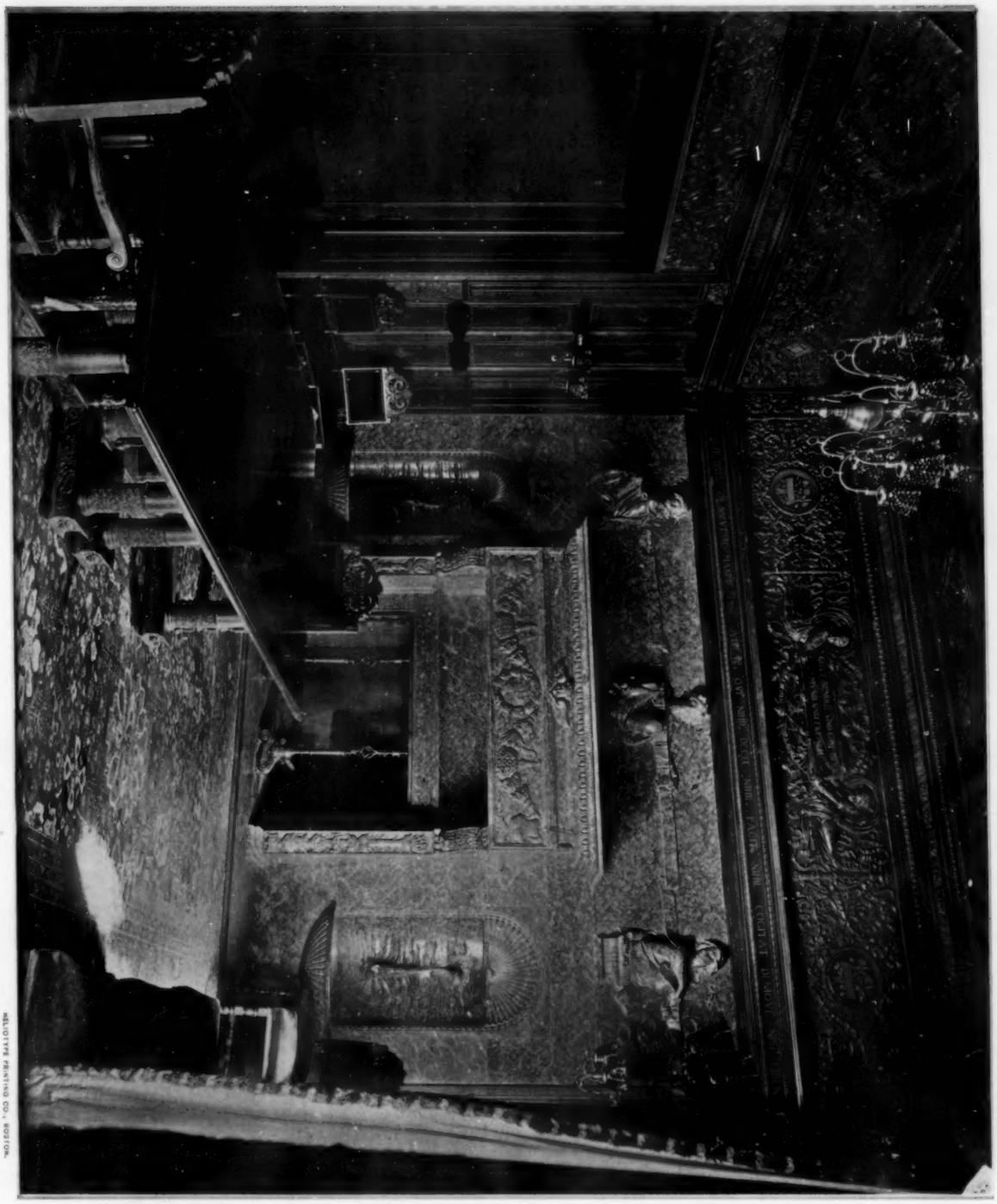


HELIOTYPE PRINTING CO. BOSTON

COPYRIGHT 1889 BY TICKNOR & Co

Rue du Château
Josselin

Copyright, 1889, by TICKNOR & Co.



EAST END OF DINING ROOM IN THE HOUSE OF HON. WHITELAW REID, NEW YORK, N. Y.

McKIM, MEAD & WHITE, Architects.

HELIOTYPE PRINTING CO., BOSTON.